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REPORT

OF THE

Board of State Engineers

OF THE

STATE OF LOUISIANA

TO

HIS EXCELLENCY, WILLIAM WRIGHT HEARD,

GOVERNOR OF LOUISIANA,

FROM

APRIL 20, 1900, to APRIL 21, 1902.

BATON ROUGE,
THE ADVOCATE, OFFICIAL JOURNAL OF THE STATE OF LOUISIANA.
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STATE OF LOUISIANA,
OFFICE BOARD OF STATE OF ENGINEERS,
New Orleans, La., April 21, 1902.

To His Excellency, W. W. Heard, Governor of Louisiana:

SIR—The Board of State Engineers has the honor to submit for your Excellency's information the following report, with accompanying appendices, covering the period from April 20, 1900, to April 21, 1902.

DUTIES AND PERSONNEL OF THE BOARD.

The Board of State Engineers was created by Act 33, approved February 10, 1879. The duties of the Board, as defined by this act, are to make surveys of water courses, public works and levees of the State; to "report to the Governor of "the State the improvements necessary and the levees to be "constructed, which are of prime importance to the State at "large;" to furnish estimates and specifications of the work so required; to examine and measure the work recommended by the Board and done under contracts made by the State, and to certify the amount of payments due for work thus executed.

Under the provisions of later laws they have been made, in general terms, the engineers and advisers of twelve out of the thirteen Boards of Levee Commissioners now organized in the State, viz:

1. The Fifth Louisiana Levee District, by Act 44 of 1886;
2. The Tensas Basin Levee District, by Act 59 of 1886;
3. The Red River, Atchafalaya and Bayou Bœuf Levee District, by Act 79 of 1890;
4. The Pontchartrain Levee District, by Act 95 of 1890;
5. The Atchafalaya Basin Levee District, by Act 97 of 1890;
6. The Lafourche Basin Levee District, by Act 13 of 1892;
7. The Lake Borgne Basin Levee District, by Act 14 of 1892;

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7. The Lake Borgne Basin Levee District, by Act 14 of 1892;

8. The Caddo Levee District, by Act 74 of 1892;
9. The Bossier Levee District, by Act 89 of 1892;
10. The Buras Levee District, by Act 18 of 1894;
11. The Cat Island Levee District, by Act 110 of 1894;
12. The Grand Prairie Levee District, by Act 24 of 1898.

In the Orleans Levee District, under the provisions of Act 79 of 1892, the only duty of the Board of State Engineers is to approve or disapprove the "location, construction and re-"pairs of all levees on the river front of said district."

Act 144 of 1888 makes it the duty of the Board "to furnish "such lines and levels, plans and estimates as may be con-"sidered necessary for the proper and efficient execution of the "work" to be done by the Board of Control of the New Basin Canal.

Article 294 of the Constitution of 1898, directs that the Board "whenever called on so to do, shall furnish the dif-"ferent road districts with plans and specifications for public "roads, and such assistance and advice as will tend to create a "uniform system of public roads throughout the State;" and under Article 239 it devolves upon the Board, in certain cases, to give or withhold to the Boards of Commissioners of the several levee districts of the State, authority to contract with or permit steam railroad corporations to construct, maintain and operate railroad tracks upon the public levees.

The Board has also been called upon to make a number of examinations and surveys for drainage work proposed or undertaken by several levee districts, and for the improvement of the plantations of the State penitentiary, the Capitol grounds, etc.

The performance of these duties has required the constant care and attention of the members of the Board during the past two years, and has required the regular employment of two or three surveyors and rodmen as assistants in the field, as well as the temporary services of other employees both in the field and in the office.

The members of the Board remained the same as at the date of our last report until July 14, 1900, on which date M. P. Robertson was appointed, and Messrs. Lewis, Thompson and Perrilliat were re-appointed as Assistant State Engineers,

the Chief State Engineer having been previously re-appointed.

On July 10, 1901, H. Bolivar Thompson, who had been a member of the Board since July, 1882, and connected with it many years previously as its Secretary, and in other trusted positions, died at his home in New Orleans. He was an efficient officer and a faithful public servant. He had many friends throughout the State and his loss was deeply felt by them and by his associates. On August 1, 1901, the vacancy caused by his death was filled by the appointment and qualifying of F. M. Kerr, as Assistant State Engineer.

During the period covered by this report, the several members of the Board of State Engineers have given their attention, as heretofore, to the affairs of all the levee districts, and to duties in any one of them as occasion might require. As a matter of convenience, however, the work required in the Pontchartrain, the Lafourche Basin, the Lake Borgne Basin, the Buras and the Grand Prairie Levee District has received the special attention of Assistant State Engineer Lewis; and that in the Caddo, the Bossier and the Red River, Atchafalaya and Bayou Bœuf Levee Districts, has been mostly attended to by Assistant State Engineer Kerr—though for a part the time in immediate charge of Assistant State Engineer Robertson. The work required in the Fifth Louisiana Levee District had the special attention of Assistant State Engineer Thompson until his death, and subsequently that of Assistant State Engineer Robertson. The work of the Tensas Basin Levee District has been successively in the immediate charge of Assistant State Engineers Kerr, Thompson and Robertson. Assistant State Engineer Perrilliat has performed the duties required for the work of the Atchafalaya Levee District and has attended to most of the work called for by the Board of Control of the New Basin Canal and Shell Road.

LEVEE WORK OF THE PAST TWO YEARS.

The work of improving the public levees in Louisiana and of those in the lower counties of Arkansas directly protecting Louisiana, has been continued during the period since our last biennial report by the several levee districts, by the State and by the United States. The failure of Congress

at its last session to pass a "Rivers and Harbors Act," or to make appropriations for continuing the improvement of the Mississippi River, presumably reduced the work upon levees done by the United States to a much smaller quantity than would otherwise have been undertaken. But the total amount of levee work done by all parties in interest and the measure of the general improvement accomplished during the two years compares favorably with the results obtained from work done in similar periods in the past.

The work done since April 20, 1900, sums up approximately as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the Levee Districts	21.84	122.07	5,392,958	$ 884,999 71
By the State of Louisiana	20.24	30.15	2,131,571	332,118 53
By the United States	8.63	77.18	5,239,346	713,608 62
Aggregates	50.71	229.40	12,763,875	$1,930,726 86

As regards locality, the work may be divided as follows:

LOCALITY	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
IN ARKANSAS:				
On the Mississippi River	1.81	31.25	921,158	$ 173,795 72
On the Arkansas River	1.50	.....	244,090	29,097 68
IN LOUISIANA:				
On the Mississippi River	25.58	127.45	7,756,560	1,169,881 92
On the Red River	8.42	1.76	602,995	96,455 16
On the Atchafalaya River	8.08	48.11	2,269,518	310,812 30
On Bayou Lafourche	3.83	4.97	550,490	93,409 73
On Bayou des Glaizes	1.49	15.86	419,064	57,274 35
Aggregates	50.71	229.40	12,763,875	$1,930,726 86

The foregoing tables do not include the extensive drainage work undertaken by the Red River, Atchafalaya and Bayou Bœuf Levee District, estimated to cost about $197,000.00. The work thus far done amounts to $69,853.02.

There remains in addition to the above, under contracts of the State and the several levee districts now in course of execution, a large amount of levee work still to be done, estimated to require about 1,305,000 cubic yards of earthwork, and to cost about $248,000.00.

A considerable amount of work has been done and expenditure incurred by the levee districts and by the United States for weed-cutting and minor repairs to levees, and for wooden revetments, etc., which have been built by some of the levee districts. The quantity and cost of this class of work has not in all cases been reported to this office and is not included in the above table, but so far as ascertained is given in Appendix A, and amounts to about $161,301.46.

Details relative to the location, character, extent and cost of the levee work of the past two years will be found in the paragraphs of this report headed the "Levee Districts," and in tabular form in Appendix A.

THE CONSTRUCTION OF NEW LEVEES.

Within the past few years a gradual change has taken place in the construction of new levees, especially in the upper districts of the State where the caving of the river banks is most rapid and irregular. Owing to the higher grade now given the levees, the construction of new levees has called for a much larger number of cubic yards to the running foot than was previously required. These new levees have, therefore, become works of great magnitude, involving larger expenditures, not only on account of the increased quantity of earthwork, but sometimes also in the price per cubic yard, and many of them require a longer time for their construction.

Formerly, it was generally possible, and often good policy, to await developments, such as the actual caving of of the existing levees, before new ones were undertaken. It now sometimes appears necessary—owing to the longer time required for building these greater works, and in order to insure safety—that new levees should be undertaken a year

or more before they are actually needed. It is impossible to predict with certainty the exact time when a levee will be breached by the caving river banks, and this fact has sometimes caused the undertaking of new levees some considerable time before they were actually needed. It is plainly the duty of the authorities in charge to take no unnecessary chances in the premises, and, whenever means can be made available, to begin the construction of these important works in time for them to be completed, if possible, before the existing lines are destroyed by the caving of the banks; for although the old levees do not always cave into the river as soon as may have been expected when the new levees were undertaken, and it may then appear that work has been done before the actual need for it has developed, yet, under the circumstances, there seems to be no other safe course to pursue.

The increased height of the levees and the consequent addition to the labor and difficulty attending their construction, have shown that the present methods of doing the work should be improved. Levees in many localities are becoming too large and too high to at all times be built to advantage by men with wheelbarrows, or for the best results in economical construction with mules and scrapers. It would seem that the use of power-driven machinery in levee building may be the proper solution of this difficulty. Several attempts have been made in this direction, and although machines have been devised which give satisfactory results under certain conditions, yet up to the present time no system of machinery has been introduced which will meet all cases.

The Board of State Engineers invites the attention of engineers and contractors interested in earth handling machinery to this field of work, believing that in it will be found a source of profit both for the contractors and the State.

THE LEVEE DISTRICTS.

The thirteen corporate levee districts of the State remain constituted as they were at the date of our last biennial report, except that, by Act 43 of 1900, the limits of the Grand Prairie Levee District were extended about nine miles southward "to the lower line of Baptiste Collette Gap."

Under several Acts of 1900 the Caddo Levee District, the Red River, Atchafalaya and Bayou Bœuf Levee District and the Grand Prairie Levee District have heen authorized to increase their issues of bonds, so that the aggregate of district levee bonds now authorized in all the districts (excluding the Cat Island Levee District) is $4,859,000. The aggregate assessed valuation of the same levee districts is $197,395,421.

The Tensas Basin Levee District comprises the Parishes of Morehouse, West Carroll, Richland, Franklin and Catahoula, with those portions of Ouachita and Caldwell Parishes lying east of the Ouachita River. It is more subject to overflow by flood waters escaping from the Mississippi and Arkansas Rivers in Arkansas, than from any other source; and the work of the district has always been mostly applied to the construction and improvement of levees in Desha and Chicot Counties, Arkansas, as is contemplated in the Act (No. 59 of 1886), under which the district was organized.

The United States "Upper Tensas District" includes the same levee line, and the larger part of the levee work done on this line of levees since 1881 has been by the United States.

The Board of Levee Commissioners consists of seven members, one appointed from each Parish or part of Parish in the district.

The assessed valuation on the tax rolls of 1901 is $3,155,688.

The work done by the district during the past two years has been as follows, viz: 0.50 miles of new levee, and 14.29 miles of levee enlargement; aggregating 249,692 cubic yards of earthwork, at a cost of $104,335.15.

The total amount and cost of the levee work done by the United States during the past two years in Desha and Chicot Counties, Arkansas, is as follows: 2.81 miles of new levee, and 16.96 miles of levee enlargement, involving 915,-556 cubic yards of earthwork, at a cost of $158,530.71.

The most important work of the district has been its aid in constructing the new levee at Lucca Landing, Ark., made necessary by the rapid caving of the river bank at and near that point. The failure of Congress to pass a Rivers and Harbors Act in 1901 left the United States authorities with-

out sufficient means to meet the emergency presented at Lucca Landing, so that the Tensas Basin District found it necessary to supply the larger share of the funds needed and contributed $59,968,46 of the total amount ($90,700) paid for the work.

The United States paid $22,980.76, and the Chicot Levee Board $7,750.77.

The line of the so-called Opossum Fork levee turns up Amos Bayou and follows it to Costello's Gin. This point is, at present, the head of the system. It is not, however, as sometimes supposed, on land above high water, for during such floods as that of 1897, a considerable volume of water flows around the head of the system and finds its way into Bayou Macon and other streams, and thus into Louisiana.

It is difficult to obtain the necessary right-of-way for the extension of this line to a point above overflow, because some of the owners of the land through which it would have to be located object to the extension of the system, and have already thrown obstacles in the way of the maintenance of the present line. Suits have been brought and are understood to be still pending to compel the removal of the levee line along Amos Bayou and to force the opening of Boggy Bayou.

The district at various times in the past has expended considerable amounts in the maintenance of the levee line on the south bank of the Arkansas River, and a project has been favored by citizens of that section to extend the levees from the lower end of the present system on the Arkansas River to join the existing line on Cypress Creek, at or near Boggy Bayou, and to reopen the latter for drainage.

This project, if carried out, would have the effect of increasing the length of line upon which the Tensas Basin District directly depends for protection by more than sixty miles, and would make the district subject to overflow from the Arkansas River in the event of a break in the Red Fork or Lincoln County line, as the flood waters of the Arkansas would then be cut off by the proposed levee line from returning into the Mississippi River anywhere above the mouth of Red River.

The Tensas Basin Levee Board in aiding the construc-

tion and maintenance of levees in Arkansas is, of course, subject to the laws of that State, the alluvial territory of which forms but a small proportion of the whole, and in which the privileges and authority given by law to the levee districts of this State do not exist. The whole matter of the location of levees and the expropriation of lands for their construction must be met by the Desha and Chicot Levee Districts. The latter comprises the entire county, whereas the former includes only a part of Desha County, in which there are three levee districts, namely, the Laconia, the Red Fork, and the Desha Districts. The Laconia district lies north of the Arkansas River, and hence is not of direct interest to the State of Louisiana. The total revenue of the Red Fork and the Desha Districts is less than $6,000 per annum, while that of the Chicot District is about $8,000. These sums would not go far towards the protection of any threatened point nor pay for the construction of any extensive new levee, especially where the land thrown out would have to be paid for. These levee districts, therefore, can hardly be depended on to do more than furnish right-of-way; and so the United States and the Tensas Basin Levee District must probably continue, as heretofore, to supply the larger share of the means for maintaining and improving the levees.

The Fifth Louisiana Levee District is composed of the Parishes of East Carroll, Madison, Tensas and Concordia. It has an area of 1,529,600 acres, of which 230,223 acres are under cultivation.

Its assessed valuation on the tax rolls of 1901 is $5,847,726.

It has a frontage on the Mississippi River of 232 miles, and a levee line of 217.2 miles protecting 206 miles of river front. This leaves to be protected 26 miles at the lower end of the district, though a part of it is now partially protected by private levees and fragmentary portions of old levee.

The levee line of the northern part of the district, above a point opposite Warrenton, Mississippi, is included in the United States "Upper Tensas District," and the southern part in the United States "Lower Tensas District."

There are eight Levee Commissioners—two appointed from each parish.

The work in this district during the past two years, has consisted in raising and enlarging levees deficient in height and section to a grade generally three feet above the high water of 1897, or, in some cases, to the "Commission Grade," and in constructing such new levees as have become necessary, from time to time, by reason of caving banks. It is gratifying to state that all new levees undertaken during 1901 are completed, and also most of the enlargement work.

The amount and cost of the work done in the district during the past two years by the district, the State and the United States, is approximately as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the District	2.87	31.14	994,925	$ 145,377 18
By the State	3.98	1.18	580,432	87,831 61
By the United States	5.02	20.85	2,238,876	339,722 37
Totals	11.87	53.17	3,814,233	$ 572,931 16

In addition to the above the State and district have under contract (construction notes for which have already been furnished to contractors) a large amount of levee work, which will be carried on continuously until completed, estimated to require about 297,380 cubic yards of earthwork and to cost about $59,250.

A period of four years of comparatively low water on the front of this district and the consequent moderate degree of caving has enabled the State and district during the past two years to take care of all threatened points by the construction of new levees, and to raise considerable stretches of levees of low grade, where sufficiently remote from the river to warrant their enlargement. The district has also been relieved of the repair of damages usually caused by floods, such as wave wash and current wash, and thus enabled to apply the money usually reserved for these purposes to the improvement of the levees. Care has been necessary, however,

in letting work, to reserve a fund for emergencies, as owing to the failure of the Rivers and Harbors Bill at the last session of Congress, the United States authorities have been unable to undertake any new work in the district during the year 1901, so that the maintenance of the levee system during that period has fallen upon the State and district.

The Bank revetments at Louisiana Bend, Lake Providence, Delta Point, Kemp Bend, and Giles Bend, built by the United States to prevent caving banks, have been kept in repair by it and have proven a success. It is to be hoped that this class of work may ultimately be extended to cover every rapidly caving bend of the river.

The improved condition of the levee system of this district since the high water of 1897 through the united efforts of the State, district and Government, and the fortunate circumstance of having had no great stage of the river since then, has inspired corporations and capitalists with confidence in its stability, and has greatly enhanced the value of property and encouraged immigration. The district has been able to dispose of all its vacant lands, placing them on the tax rolls.

Two large trunk lines, the Texas & Pacific Railway and the Iron Mountain Railroad, have been located through the whole length of the district and are now in the course of construction, connecting the river towns with their systems and running within reaching distance of the levee line. Telephones are being put in every country store, and the facilities for travel and the handling of material in case of floods have been very much increased, so that the ability of levee authorities to communicate rapidly in case of high water will be greater than ever before.

The Texas and Pacific Railway Company in extending its line of railroad up the west bank of the Mississippi River, now has under construction an embankment through the Bougere swamp. A portion of this embankment is built to a height about the same as that of the high water plane in 1897; though it has neither the width nor the area of cross-section usually prescribed for a levee of the same height, nor has it been built with such care as regards the prepara-

tion of the ground on which it stands, and the exclusion of improper materials from its composition, as is now generally thought necessary for security.

At the same time it is probable that this embankment might serve for a levee against such moderate floods as have occurred in at least six out of the past ten years, and it might be possible to enlarge and strengthen it sometime in the future, if means become available, and make it as secure as any other levee line.

It has, therefore, been decided by the Fifth Louisiana Levee District, upon the recommendation of this Board, to undertake the construction of a new levee from a point about a half mile above Bougere Landing to join this railroad embankment near Boggy Bayou; and the President of the Board has been authorized to advertise for proposals to this end for tne construction of about 300,000 cubic yards of new levee. There is little doubt that the Federal authorities will second the efforts of the State and district in the extension of the levee line in the Fifth District as soon as funds become available.

In view of the contemplated expenditure by the district of a large sum of money in the closure of Bougere crevasse, the reasons which may heretofore have justified the exemption of the lower part of Concordia Parish from certain levee taxes and local assessments imposed upon other parts of the district, no longer exist, and hence, the Levee Board has passed a resolution placing this part of the district on the same basis of taxation as the remainder of it. The immediate repeal of that part of Act Act No. 11 of 1898, making a distinction as regards the special assessment on cotton between the lower end of Concordia Parish and other portions of the district, would now be just and proper.

It is not to be expected that the extension of the levee line on the front of the Mississippi River, even as far as the mouth of Red River, with that tributary remaining unclosed would absolutely protect the back lands of Concordia and Catahoula Parishes against high water from the Mississippi. This end could only be attained if Old River were diked and entirely divorced from the Mississippi. Then the levee system

on the west bank of the Mississippi River could be made continuous from the bank of Amos Bayou in Arkansas to the Gulf; and the waters of the Red and Ouachita Rivers would be discharged through the Atchafalaya—which, in fact, is practically the case at this time, the capacity of the Atchafalaya River being greater than that of the Red and Ouachita, it also receives, in addition to the waters of these two streams, a considerable quantity through Old River from the Mississippi.

A tabular statement showing the present elevation of the levees above the high waters of 1897 an an approximate estimate of the earthwork required to enlarge the existing levees to the grade adopted by the Mississippi River Commission will be found in Appendix B.

The Atchafalaya Basin Levee District comprises the territory below the socalled mouth of Red River—that is, South of Old River—between the Mississippi River and Bayou Lafourche on the east, and the Atchafalaya River and Bayou Teche (below the northern boundary of St. Martin) on the west. It is composed of the Parishes of Pointe Coupee, West Baton Rouge and Terrebonne, and parts of the Parishes of Iberville, Ascension, St. Martin, Iberia, St. Mary, Assumption and Lafourche.

The assessment rolls of 1901 showed that the territory embraced by the Atchafalaya Basin Levee District was assessed at $15,656,903.

It has a board of seven Levee Commissioners—three from the Mississippi River Parishes, three from the interior Parishes, and one at large, appointed "on the recommendation of the railroads of said district."

During the last two years the Board of Levee Commissioners has continued the work of levee improvement with its usual activity.

On the Mississippi River the work done has consisted principally in the raising and enlarging of the levees, and the construction of two new levees which have been undertaken in anticipation of the caving of the existing levees at certain points. The work of raising and enlarging the levees between Port Allen and Donaldsonville has been completed to a grade not less than 3 feet above the highest water of the past, which occurred in the year 1897. Between Port Allen and the mouth of Red River a great deal of raising and enlargement work has been done and is now in process of construction; but the grade adopted for this stretch is known as the Mississippi River Commission Grade, and varies from 4.30 feet above the high water of 1897 at Red River Landing, to 4.65 feet above the same high water plane at Baton Rouge.

The line of levees on the Atchafalaya River, between the head of the Atchafalaya, at Barbres Landing and Melville, has been raised and enlarged to a grade not less than 3 feet above the high water of 1897; and from Bayou Marine to the railroad crossing at Melville this grade has been gradually raised to 4.0 feet above the high water of 1897, in anticipation of the increased flood height which may result from the extension of the levee lines on the Atchafalaya. In addition to this, the levee district has built some five miles of new levee below the railroad crossing at Melville, thereby extending its line of levees on the Atchafalaya River about six miles below that point. This work is now in process of construction, and will probably be continued by the Levee Board.

On Bayou Lafourche, a limited amount of work has been done, consisting mostly in the raising of low stretches.

The District Levee Board, State authorities and United States Government, have worked on the Mississippi River front of the district hand in hand, each doing as much as the means at its command permitted.

The following tabulation represents the work done in the district during the last two years:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
ON THE MISSISSIPPI RIVER.				
By the District	1.92	9.74	741,614	$ 137,599 45
By the State	.....	8.42	290,418	49,947 83
By the United States	.....	7.48	534,882	85,102 81
Totals	1.92	25.64	1,566,914	$ 272,650 09
ON THE ATCHAFALAYA RIVER.				
By the District	4.70	23.79	1,310,898	$ 210,236 70
ON BAYOU LAFOURCHE.				
By the District	.....	1.04	47,971	$ 7,103 04
RECAPITULATION THROUGHOUT THE DISTRICT.				
By the District	6.62	34.57	2,110,483	$ 354,939 19
By the State	.....	8.42	290,418	49,947 83
By the United States	.....	7.48	534,882	85,102 81
Grand Totals	6.62	50.47	2,935,783	$ 489,989 83

In addition to this, construction notes have been issued to contractors under various existing contracts of the State and district calling for about 602,400 cubic yards of earthwork, and an approximate expenditure of $126,700, which work will be carried on continuously until completed.

The work done on Bayou Lafourche during this period has been relatively less than that done in other portions of the district, owing to the hopelessness of the task of successfully protecting lower Bayou Lafourche from overflow, and also owing to the anticipated construction of a lock or dam at its head, which would render further levee work on Bayou Lafourche unnecessary. In this connection it is interesting to state that, although the highest stage reached thus far this year in the Mississippi River, at Donaldsonville, the head of Bayou Lafourche, was 9.9 feet below the maximum stage, and caused no apprehension of danger on the Mississippi River; yet, at Lockport, on Bayou Lafourche, 58 miles below its head, the stage already reached is only 3.4 feet below the highest water mark, and occasions considerable anxiety to the residents on its banks.

The Cat Island Levee District in the Parish of West Feliciana was created by Act 110 of 1894. It comprises the territory on the east bank of the Mississippi River from Ratcliff's Landing to Bayou Sara. The act provided for the appointment of five levee commissioners, and authorized the issuance of bonds to the amount of one hundred thousand dollars.

Surveys have shown that the cost of levees necessary for protection would be excessive as compared with probable revenues, and that even after building an effective levee system, the drainage of the district during prolonged seasons of high water, could only be maintained by the operation of costly pumping machinery. Under these circumstances no action has ever been taken by the Commissioners for raising funds or for undertaking levee work. The act under which the district was created has never been repealed; and it still remains, as heretofore, a levee district only in name.

The Pontchartrain Levee District comprises the alluvial ands on the east bank of the Mississippi River between the

cities of Baton Rouge and New Orleans, consisting of parts of the parishes of East Baton Rouge, Iberville, Ascension, Saint James, Saint John, Saint Charles and Jefferson. Its situation is so favorable as to make it only dependent for profection upon the integrity of the one hundred and twenty-six miles of levee on the Mississippi River front.

The assessed valuation of the district on the tax rolls of 1901 was $6,119,453.

There are nine Commissioners, one from each Parish in the District, and one representative respectively of the Illinois Central Railroad Company and of the Louisville, New Orleans and Texas Railway Company.

The work undertaken by the district during the past two years has been mostly confined to the repair and maintenance of its existing levees—such as keeping the line free from weeds, cutting out crayfish and muskrat holes, construction of revetments, and cleaning of drain ditches. It has expended $5,463.57 in this class of work. A great deal of enlargement work is still required to be done on the levees to bring them up to the adopted grade and section of the Mississippi River Commission. It is also probable that through the caving of river banks, several new and costly lines of levees will be required in the near future.

The levee work done by the district during the past two years has amounted to 6,263 cubic yards of earthwork, at a cost of $2,318.32.

During the same period the State has built 0.30 miles of new levees, and 3.83 miles of enlargement of existing levees, amounting to 131,364 cubic yards of earthwork, at a cost of $23,996.64, and the United States has enlarged 12.60 miles of old levee, involving 865,112 cubic yards of earthwork, at a cost of $101,803.49.

The Lafourche Basin Levee District comprises all of the alluvial lands except the Parish of Orleans, lying between Bayou Lafourche, the Mississippi River, and the Gulf of Mexico, viz: Parts of the Parishes of Ascension, St. James, St. Charles, Jefferson, Plaquemines (to the lower line of Riceland plantation) Assumption and Lafourche (as far down as the lower limits of "Cher Ami Canal"), requiring a levee line

of one hundred and twenty-one miles fronting the Mississippi River, and seventy miles on the Lafourche.

The assessed valuation of the district on the tax rolls of 1901 was $10,516,537.

There are nine Commissioners, one from each parish in the district, and one in the district at large appointed upon the recommendation of the railroads of the district.

The work done by the State and district during the past two years has been the building of 2.28 miles of new levee and the enlargement of 3.76 miles of existing levee on the Mississippi River (its eastern boundary), amounting to 373,-129 cubic yards of earthwork, and costing $60,893.45; and the building of 3.83 miles of new levee, and the enlargement of 3.93 miles of existing levee on Bayou Lafourche (its western boundary), amounting to 502,519 cubic yards of earthwork, at a cost of $86,306.69.

During the same period the United States has built 13.89 miles of enlargement of existing levees on the Mississippi River, amounting to 527,630 cubic yards of earthwork, at a cost of $66,925.63; making the total of levee work done in the district as follows: 2.28 miles of new levee built; 17.65 miles of levee enlarged, and 900,759 cubic yards of earthwork done at a cost of $127,819.08.

In addition to this, construction notes have been issued to contractors under various existing contracts of the district calling for about 165,500 cubic yards of earthwork, at an estimated cost of about $36,700.

The Orleans Levee District was created by Act No. 93 of 1890. Under this act the Parish of Orleans was "formed into a public levee district," and a board of nine levee commissioners was provided for, seven appointed by the Governor of the State, and two (the Mayor and the Commissioner of Public Works of New Orleans) *ex officio*.

The engineer of the district, Mr. Gervais Lombard, has kindly furnished us with a tabular statement of the work done by the Board of Commissioners during the past two years under contracts costing $14,218.31 (for which see Appendix A), and with the following information relative to the length and grade of levees, and the cost of maintenance:

"But little change has been made in the location or "height of the levees in the Orleans District during the past "two years. The length of the levee on the right bank of the "Mississippi River is 13.88 miles; on the left bank, 12.62 miles; "length of interior and rear protection levees, 48.00 miles; "making a total of 74.5 miles.

"Of the river front levee, 5.5 miles is 4 feet above highest "water (1897); 10.5 miles is 3 feet above highest water; 5.5 "miles is 2 feet above highest water; 4.29 miles is 1 foot above "highest water; and 0.7 miles is at or below highest water.

"While the work done by contract is meagre, there has "been no cessation in the general maintenance and repair "work by the day forces. The cost of the labor and materials "for said general maintenance and repair work during the past "two years amounted to $64,518.31."

The Lake Borgne Basin Levee District comprises the alluvial lands on the east bank of the Mississippi River below the City of New Orleans, situated in the Parish of St. Bernard, and in that part of the Parish of Plaquemines lying north of the lower line of Bohemia plantation. Its levee line is forty-eight miles long.

The assessed valuation of the district on the tax rolls of 1901, was $1,669,516.

There are three commissioners, one from each parish in the district, and one representative of the New Orleans and Southern Railroad Co.

The District Levee Board has expended during the past two years $9,351.81 on the repair and maintenance of its existing levees, such as keeping the line free from weeds, cutting out of crayfish and muskrat holes, the construction of revetments, and the cleaning of drain ditches.

The work done by the State for the past two years has been as follows: 0.71 miles of new levee, and 1.94 miles of levee enlargement, requiring 70,814 cubic yards of earthwork, at a cost of $9,878.55.

During the same period the United States has enlarged 4.69 miles of old levee in the district, involving 105,123 cubic yards of earthwork, at a cost of $14,028.62.

The Grand Prairie Levee District comprises the alluvial lands on the east bank of the Mississippi River, contained within the Parish of Plaquemines, from the lower line of Bohemia plantation to the lower line of Baptiste Collette's Gap, requiring a levee line of 33.30 miles fronting the Mississippi River.

The assessed valuation of the district on the tax rolls of 1901 was $181,900.

There are five commissioners in the district.

The 23.65 miles of continuous levee extending from the upper boundary of the district to the upper line of the United States Reservation for Fort St. Philip, has been very much improved since the organization of the district in 1898; but it will require a great deal of enlargement work to bring it up to the adopted grade and section of the Mississippi River Commission.

The levees below the lower line of the United States Reservation for Fort St. Philip to Baptiste Collette's Gap, some nine miles, are very small and fragmentary, and were badly wrecked by the storm of August 15, 1901. The land in this stretch on the immediate river front is comparatively high, with but little depth, and is covered by river water in extreme floods. It is also subject to overflow from storm waters of the Gulf. It is mostly used for grazing or pasture land, with here and there small areas or settlements which are enclosed by levees and cultivated.

The levees in front of the most important of these settlements at "New Canal" and also a small new levee at "Zettwoch," amounting to 0.5 miles of new levee, and 0.18 miles of levee enlargement, and requiring 7,286 cubic yards of earthwork, at a cost of $983.60, were built by the district.

The work done by the State during the past two years has been as follows, viz: 4,20 miles of new levee, and 1.37 miles of levee enlargement, aggregating 115,748 cubic yards of earthwork, at a cost of $15,341.21; and the United States has built new levees amounting to 0.57 miles in length, involving 20,453 cubic yards of earthwork, at a cost of $2,701.12.

The Buras Levee District comprises the alluvial lands on the west bank of the Mississippi River "in the Parish of "Plaquemines, south of a line drawn from the lower line of "Riceland plantation to the limits of Harang Canal on Bayou "Lafourche," extending to the Jump, requiring a levee line of 33.76 miles fronting the Mississippi River.

The assessed valuation of the district on the tax rolls of 1901 was $418,978.

There are five commissioners in the district.

The levees below the United States Reservation for Fort Jackson to the Jump were badly washed into, and wrecked in many places, by the storm of August 15, 1901. Subsequently the State, at a cost of $9,981.86 rebuilt, restored and enlarged them.

The total work done in the district by the State during the past two years has been as follows, viz: 2.90 miles of new levee, and 4.84 miles of levee enlargement, aggregating 97,159 cubic yards of earthwork, at a cost of $16,373.14.

During the same period the United States has built 0.23 miles of new levee, and enlarged 0.71 miles of old levee, requiring 31,714 cubic yards of earthwork, at a cost of $4,706.33.

The Caddo Levee District. The territory subject to the operations of the act of incorporation of this district embraces all alluvial lands and all lands subject to or liable to overflow from the waters of Red River, or its tributaries, or its outlets, situated in the Parish of Caddo, not including such lands as occur within the corporate limits of the City of Shreveport.

The assessed valuation of the district on the tax rolls of 1901 was $1,170,410.

The affairs of the district are conducted by a Board of seven Commissioners.

The distance from the upper to the lower limits of the district, by river, including old bends, is about 159 miles, but owing to the sinuosity of the river along many miles of its length, resulting in long points, with narrow necks, through a number of which cut-offs have occurred in the past, and others where cut-offs are threatened in the future, the length of public levee line apparently required and warranted, from

an economic point of view to protect its lands from the waters of Red River and its tributaries and outlets, is only about 97 miles. This is divided as follows: Above Shreveport, about 59 miles; below Shreveport, about 38 miles. Of this, about 78 miles have so far been constructed to provisional grades and sections, distributed as follows: Above Shreveport, about 40 miles; below Shreveport, about 38 miles; leaving a gap in the levee line above Shreveport, between Eric's Point and the latter place, of about 19 miles.

The construction of the levee required over the upper 10 miles of this gap will amount to about 450,000 cubic yards, and over the lower 9 miles about 1,350,000 cubic yards, or a total of about 1,800,000 cubic yards of earthwork for the whole gap.

In this estimate provision is made for embankments at two points, across Twelve-Mile Bayou, or across Red River, depending upon developments in the future course of the river in the vicinity of Cuba plantation, and at South Side and Pandora Points.

Should it become advisable to adopt a line crossing Twelve-Mile Bayou provision will have to be made additionally for quite an amount of canal work to preserve the drainage of certain areas which would thereby be impaired.

The lower part of this gap (9 miles) is also located along that part of Red River affecting the territory bounded by Twelve-Mile Bayou, Red River, and the bluffs bordering on Cross Bayou, Cross Lake and Soda Lake, which was exempted from the operations of the district in 1894, and is, therefore, a matter not necessarily demanding consideration by the district until such time as the lands covered by this exemption may again be included in the operations of the district. And even then, the necessity of leaving at least Cross Bayou open to afford drainage to the water-shed above, extending from Jefferson, Tex., to Shreveport, La., into Red River, when the stages of water in the latter will permit, will operate against the construction of this part of the line as a whole.

With the completion of the levee known as the "Upper Section of Scott's Slough to Sale and Murphy Canal," the

lines of levees in the district are now continuous, as follows: Above Shreveport, from Blanton Bluff, Ark., to Gold Point, about 40 miles; and below Shreveport, from the Bluffs on the north side of Bayou Pierre to the lower limits of the district, about 38 miles.

The levee work done in the district during the past two years is as follows: By the District—New levee, 2.08 miles; enlargement, 0.13 miles, amounting to 161,188 cubic yards, costing $29,455.76; by the State—New levee, 2.96 miles; enlargement, 0.53 miles, amounting to 220,498 cubic yards, costing $31,795.27.

This represents a total of 5.04 miles of new levee, and 0.66 miles of enlargement, and 381,686 cubic yards of earthwork, costing $61,251.03.

All of this work has been completed.

The district expended $716.09 in weed cutting, etc.

The general condition of the lines of public levee in the Caddo Levee District continues fairly good, though complaint has still to be made of the abuses to which the levees continue in many places to be subjected.

It is a source of satisfaction, however, to be able to herein record that, at a recent meeting, the Board of Commissioners of the Caddo Levee District formulated plans to systematically and properly repair, care for and preserve the lines of levee in the district, which will no doubt tend to correct the abuses and improve the conditions to which reference is above made.

The district is once more to be congratulated upon its good fortune in continuing to suffer so little loss of line from caving banks. At several points in the district, however, the banks of the river are gradually approaching the levee line, and at no distant day provision will, no doubt, have to be made for new levees to cover certain lengths of line where conditions appear to be growing acute.

The Bossier Levee District. The territory subject to the operations of the act of incorporation of this district embraces all alluvial lands subject to or liable to overflow from the waters of Red River or its tributaries or outlets, in the Parish of Bossier, south of the line dividing the north half from the south half of Township 20 North.

The assessed valuation of the district on the tax rolls of 1901 was $1,378,740.

The affairs of the district are conducted by a Board of seven Commissioners.

The distance from the upper to the lower limits of the district by the river including old bend is about 109 miles. As in the case of the Caddo Levee District, however, and from the same causes, the length of the public levee line apparently required to protect its lands from the waters of Red River, or its tributaries or outlets, is only about 63 miles, of which about 58 miles have so far been constructed to provisional grades and sections, extending continuously from the upper limit of the district, at the foot of Hurricane Bluff, to the lower side of Ninock Lake.

To extend the levee line down to the lower limit of the district and to supply new levees, in the future, at points where the line is being gradually approached by caving banks, will require provision for quite a large amount of work.

The work done in the district during the past two years, is as follows: By the district, nothing; by the State, new levee, 3.38 miles, enlargement, 0.51 miles, amounting to 203,540 cubic yards, costing $27,626.79.

In addition to the foregoing, levee work is still in progress in the district, under a contract entered into by the State, previous to this date, at Willow Bend, amounting to about 42,000 cubic yards of earthwork, estimated to cost about $6,048.00.

The district expended $1,239.35 in minor repairs and weed cutting.

The general condition of the existing line of levee in the district is fairly good, though many parts of it continue, on account of abuses of one kind and another, seriously disfigured and reduced in section, as compared with that designed and built, and it is to be hoped that the Bossier Levee District will soon adopt measures to systematically and properly provide for the care and preservation of the lines of public levee when built, similar to those recently proposed by the Caddo Levee District.

Red River, Atchafalaya and Bayou Bœuf Levee District. The territory subject to the operations of the original act of incorporation of this district, No. 79 of 1890, embraces all lands subject to overflow in the Parishes of Rapides and Avoyelles, and that part of the Parish of St. Landry situated between the Atchafalaya River on the east, and Bayous Bœuf and Courtableau on the west and south.

In due course of law, however, as provided in Section 15 of the act of incorporation the following territory was exempted in 1890 and 1891 from the operations of the district, so far as concerns the levying of taxes for levee purposes, viz: All that section of Rapides Parish above Alexandria, bounded by Bayous Rapides, Jean de Jean and Red River, and all parts of the parish situated on the left bank of Red River; also all portions of the Parish of Avoyelles situated on the left bank of Red River, as well as all that part of the parish bounded by Bayou des Glaizes, the Atchafalaya and Red Rivers, and the public road running from David's Ferry on Red River, to Bayou des Glaizes, by way of Marksville, Mansura, and the "Long Bridge," at Bout du Bayou.

The assessed valuation of the district on the assessment rolls of 1901 was $3,577,770.

The affairs of the district are administered by a Board of three Commissioners, appointed by the Governor, one from each of the parishes composing the district.

The work done by the district during the past two years, is as follows: By the district—new levee, 4.87 miles, enlargement, 35.32 miles, amounting to 1,264,149 cubic yards, costing $139,695.83. Drainage work—clearing, 19.95 miles; embankment and excavation, 14.45 miles, amounling to 462,456 cubic yards, and costing $69,853.02. By the State—enlargement, 5.45 miles, amounting to 131,304 cubic yards, costing $25,731.46.

This represents a total of 4.87 miles of new levee, 40.77 miles of enlargement, amounting to 1,395,453 cubic yards of earthwork, costing $165,427.29; and 14.45 miles of drainage work, amounting to 462,456 cubic yards of earthwork, costing $69,858.02.

The district also expended $2,086.34 in repair work, weed

cutting, building of ramps, etc., and $612.00 for a siphon over Bayou Lamourie Dam, in connection with the works of improving drainage in the district.

In addition to the foregoing, levee work is still in progress in the district, under contracts entered into by the district and the State, for the enlargement of the line of existing levee on Bayou des Glaizes, extending from Mill Bayou to Yellow Bayou, and for the construction of the new levee, from Melville to Bayou Petite Prairie, on the Atchafalaya River, amounting to 98,000 cubic yards of earthwork, estimated to cost $19,762.00.

Under the contracts for work for improving drainage, No. 1, Bayou Lamourie Dam, has been completed; No. 2, Three Prong Lake to Bayou des Glaizes. 50 per cent. of the value of the work remains to be done; No. 3, Mill Bayou to Bayou Rouget, and Bayou Rouget to Turner's Bayou; 40 per cent. remains to be done; No. 4, Turner's Bayou to Bayou Jack, has not yet been begun; and No. 5, Alexandria to Chatlin's Lake, 90 per cent. of the value of the work remains to be done.

On Red River the line of public levee is continuous from the highlands, about one and a half miles above Alexandria on Bayou Rapides, thence down the bayou to its junction with Red River, and thence down Red River to the Avoyelles Prairies, at David's Ferry, about 37 miles in length. All of this line is generally 3 feet above the highest water of local record and in good condition, though parts of it built in the early days of the district, are small in section as compared with the section of more recent work, and some of it is showing signs of considerable wear and tear from the lapse of time and the action of the elements.

On Bayou des Glaizes the improved line of public levee at this time extends from the lower end of the Moreauville Lane to Simmsport, about 38 miles in length, and, with few exceptions, is in good condition, averaging over 2 feet above the highest water of local record from Moreauville Lane to Mill Bayou, and thence gradually rising to over 3 feet above the highest water at Yellow Bayou, and maintaining that grade to Simmsport.

On the Atchafalaya River the entire line of previously existing public levee has not only been greatly improved during the last two years, but the line has also been extended from Melville to a point about a quarter of a mile below Bayou Petite Prairie, that is, about four miles below Melville by river. This extension has not yet been completed, but when completed the length of this line of levee from Simmsport south will be about 29 miles, its crest all 3 feet above the high water mark of 1897, with a width of 8 feet and side slopes of 3 and 3 to 1.

Besides the work of levee building and enlargement, to protect the district from overflow from the high waters prevailing from time to time in the streams bordering and traversing it, the district, under the authority given it by law, has during the past two years begun a system of drainage to relieve certain areas from overflow from rain water, where natural drainage has been interrupted by reason of the extension of the lines of public levee across natural drains, previously affording relief during periods of low water in the main streams.

In this way, the district has, during the past two years, made contracts to improve drainage from Alexandria to Chatlin's Lake, from Three Prong Lake to Bayou des Glaizes, from Mill Bayou to Bayou Rouget, and from Turner's Bayou to Bayou Jack, and, as an auxiliary to the second proposition, to close Bayou Lamourie.

These contracts cover the main links in the chain of drainage work required in the district, but will, no doubt, in the future, have to be supplemented by projectes to improve drainage from Chatlin's Lake to Three Prong Lake, from Bayou Rouget to Turner's Bayou, and from Bayou Jack to Bayou Courtableau.

STAGE OF THE RIVERS.

The highest stages reached during the period since our last report, by any of the streams of Louisiana on which there are levees—except, perhaps, the lower part of Bayou Lafourche—have not been sufficient to put the levees to any severe strain. Many parts of the levee lines—those built on the higher banks—have scarcely had water against them in

the past two years. But, at the same time, it is a fact which should not be lost sight of, that, even with the moderate floods that have occurred, there would have been extensive overflows of culivated lands in Louisiana, had there been no levees to protect them.

The high water of 1897, in the Mississippi River, still remains the highest of record throughout the State, except in the short length of river just below Lake Providence, where the flood levels of 1898 were somewhat higher.

For the purpose of comparison, the highest guage readings in 1897 (the maximum recorded) with those of 1900 and 1901, at several points on the Mississippi River, are given in the following table:

	Highest known.		
LOCALITY.	1897.	1900.	1901.
Arkansas City, Ark.	51.90	39.30	43.30
Greenville, Miss	46.75	33.75	37.40
Lake Providence, La	44.54	32.95	36.45
Vicksburg, Miss	52.48	38.00	41.50
St. Joseph, La	47.58	33.70	36.90
Natchez, Miss	49.82	37.00	39.80
Red River Landing, La	50.20	36.30	37.30
Baton Rouge, La	40.65	27.25	28.21
Donaldsonville, La	32.75	21.80	22.30
Carrollton, La	19.17	12.60	12.66
Fort Jackson, La	7.20	5.90	6.00
" " (storm of August 14, 1901)			7 20

Within the two years covered by this report there has been no crevasse in any public levee in Louisiana, nor in the levees of Arkansas, which protect this State.

At this date (April 21, 1902), nothing has been reported from the upper rivers indicating the early possibility of any considerable flood this season. The tributary streams at most of the points from which reports are received and published through the U. S. Weather Bureau, are now declining. The gauge readings as reported this day at several stations are as follows: Cairo, Ill.; 28.0; Memphis, Tenn., 18.9; Helena, Ark., 28.4; Vicksburg, Miss., 40.3; New Orleans, La., 14.8.

BAYOU LAFOURCHE LOCKS.

The legislative session of 1900 passed Act No. 9, authorizing the "Atchafalaya Basin and Lafourche Basin Levee "Districts to place locks at the head of Bayou Lafourche," etc.

Further authority to do this was requested of the Fifty-Sixth Congress in a clause embodied in the Rivers and Harbors Bill of the last session. Owing to the failure of passage of this bill, it was reintroduced in the Rivers and Harbors Bill of the present Congress, passage of which is now pending. The present bill also gives authority to the levee boards to dam Bayou Lafourche during the construction of a lock, although the time allowed for the existence of this dam is too short to protect the work, and under the provisions of the bill it would become necessary to remove the dam before the work could be completed, thereby endangering and possibly destroying the entire structure.

The Board of State Engineers sees no reason to recede from the position which it has taken in previous reports regarding the desirability of locking or damming Bayou Lafourche. We still think, viewing the matter from every standpoint, that for the good of the country, this project should be carried through. Not only will the property on the banks of the bayou be thereby made safe against the frequent overflows from Bayou Lafourche which ravage it, but this project would allow the permanent deepening of the bayou by dredging, resulting in permanent benefit to navigation.

At present, during the low water stage, which lasts approximately nine months of the year, there is barely eighteen inches of water over the bars of Bayou Lafourche. The United States Government, by yearly appropriations, has undertaken to improve this condition, but the work done each year is practically obliterated during the following high water stage by the silt deposited in the bed of the bayou at that time. This condition of affairs has been growing steadily worse, year by year, so that the bayou is generally closed to navigation for about nine months of the year.

The closure of Bayou Lafourche would also permit the opening of suitable drains at a few selected points, so as to

empty the drainage basins lying on both sides of it, thus enhancing the value of the property adjacent to the bayou and increasing the area of lands subject to cultivation.

We therefore earnestly hope that the levee districts and Congress will be able to devise a plan which will result in the closure, by lock or dam, of Bayou Lafourche, at its head.

NEW BASIN CANAL AND SHELL ROAD.

The Board of Control of the New Basin Canal and Shell Road has steadily continued the improvement of the property which it has in charge. During the last two years the 12,000 feet of revetment which had been undertaken between the New Orleans and Western railroad bridge and West End has been completed, and the space between this revetment and the Shell Road, from which the earth had been washed away in the past has been filled in by dredging from the canal. This filling has been leveled off and graded, and will eventually widen the Shell Road and prevent further encroachment into the bank of the canal, with its accompanying shoaling of the waterway.

The storm of August 15, 1901, caused a considerable amount of damage to the jetties projecting from the canal into the lake, but this is in process of repair.

Various minor engineering questions were submitted by the Board of Control to the Board of State Engineers, such as the opening of flushing intakes for the drainage and sewerage system from the canal, and the location of the proposed sewers under its bed. All of these points have so far, it is understood, been settled to the satisfaction of all parties. The property confided to the care of the Board of Control has been steadily improving for the last few years, and is now in better condition than it was at any previous time.

APPENDICES.

A uumber of tabular statements showing details of the levee work of the past two years and other statistics are presented herewith, as also copies of sundry special reports and letters relative to matters deemed of public interest. Though they are not in all cases referred to in the text of the report they are submitted as a part thereof in the following appendices, viz:

APPENDIX A.—Tabular statements relative to quantity, length and cost of levee work undertaken by the State of Louisiana, the several Boards of Levee Commissioners and the United States, in Louisiana and a part of Arkansas, from April 20, 1900, to April 21, 1902.

APPENDIX B.—Copies of sundry special reports, letters, etc., from the Board of State Engineers to the various Levee Boards and Commissioners, and to others.

All of which is respectfully submitted,

THE BOARD OF STATE ENGINEERS.

HENRY B. RICHARDSON,
Chief State Engineer.
SIDNEY F. LEWIS,
ARSENE PERRILLIAT,
M. P. ROBERTSON,
FRANK M. KERR,
Assistant State Engineers.

WALTER H. HOFFMAN,
Secretary.

OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 12th, 1901.

On July 10th, 1901, at 10:10 P. M., Henry Bolivar Thompson, a member of this Board, died. after a lingering illness.

He was born at St. Joseph, Mo., October 9th, 1852.

He became connected with the Board of State Engineers as Rodman, in 1867; and in 1870 was appointed assistant to the engineers of the Board.

In 1877 was appointed Chief Clerk, and subsequently Secretary of the Board of State Engineers. In 1882 Governor McEnery appointed him Assistant State Engineer, in which position he has ever since remained a member of this Board.

During the entire duration of his public service, in whatever capacity, he has discharged his duties with ability and faithfulness.

His great experience and sound judgment made him at all times one of the most efficient members of the Board of State Engineers, and by his death the State of Louisiana loses a most efficient officer, while his colleagues lose a true friend.

It is resolved by the Board of State Engineers that the above be spread upon its minutes, and that a copy of the same be forwarded to the widow and family of the deceased, with the profound sympathy of the members of this Board.

APPENDIX A.

Tabular Statements Relative to Quantity, Length and Cost of Levee Work Undertaken by the State of Louisiana, the Several Boards of Levee Commissioners, and the United States, in Louisiana and a part of Arkansas, from April 20, 1900, to April 21, 1902.

APPENDIX A. STATEMENT

Levee work undertaken by the State of Louisiana in the several Levee
to April 21, 1902, with six contracts of earlier

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
			FIFTH LOUISIANA LEVEE			
1	Longwood	East Carroll	Mar. 26, 1900	June 18, 1900	3,437	2,100
2	Donna Vista	East Carroll	Sep. 10, 1901			6,300
3	Alsatia	East Carroll	Nov. 19, 1901			10,450
4	Cabin Teele	Madison	Aug. 27, 1900	Apr. 12, 1901	7,207	
5	Cabin Teele	Madison	Sep. 10, 1901		3,337	4,225
6	Killarney	Madison	Jan. 15, 1902		8,675	
7	Martin Loop	Madison	Sep. 10, 1901	Jan. 13, 1902	1,426	
8	Claggett	Tensas	Oct. 22, 1901	Apr. 1, 1902	2,057	
9	Green	Concordia	Oct. 3, 1900	Apr. 6, 1901	2,588	
	Totals				28,727	23,075
	Less amount done previous to April 20, 1900, and not completed April 21, 1902				7,688	16,835
	Work done from April 20, 1900, to April 21, 1902				21,039 or 3.98 mls	6,240 or 1.18 mls
	Amounts deducted as above:					
	Work done previous to April 20, 1900				900	
	Work not completed April 20, 1902				6,788	16,835
	Total to be deducted				7,688	16,835
			ATCHAFALAYA BASIN LEVEE			
10	Raccourci to Longwood	Pointe Coupee	Dec. 14, 1900	May 21, 1901		14,439
11	Fannie Richie	Pointe Coupee	Jan. 15, 1902			3,141
	Sec. Claiborne to Dayries					1,501
12	Belmont to Viola	W. Baton Rouge	Jan. 15, 1902			11,490
13	Australia	Iberville	Nov. 10, 1899	Apr. 22, 1901		23,942
	Totals					54,513
	Less amount done previous to April 20, 1900, and not completed April 21, 1902					10,053
	Work done from April 20, 1900, to April 21, 1902					44,460 or 8.42 mls
	Amounts deducted as above:					
	Work done previous to April 20, 1900					4,927
	Work not completed April 21, 1902					5,126
	Total to be deducted					10,053

No. 1. STATE CONTRACTS.

Districts, under forty-two contracts entered into from April 20, 1900, date, not completed April 20, 1900.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT				
143,781	15.45	$22,214 16	Mississippi Riv.	
42,531	12.48	5,307 86	Mississippi Riv.	
64,145	22.	14,111 90	Mississippi Riv.	
207,595	13.23	27,464 81	Mississippi Riv.	
59,447	11.97	7,115 80	Mississippi Riv.	
199,827	12.19	24,358 91	Mississippi Riv.	
48,119	23.74	11,423 45	Mississippi Riv.	
61,433	18.50	11,365 10	Mississippi Riv.	
50,311	13.43	6,756 76	Mississippi Riv.	
877,189	.....	$130,118 75		
296,757	.....	42,287 14		
580,432	.....	$87,831 61		
.....	.....	.....	.....	Average price 15.13 cents per cubic yard
30,000	.....	$ 4,635 00		
266,757	.....	37,652 14		
296,757	.....	$42,287 14		
DISTRICT				
115,870	19.75	$22,884 32	Mississippi Riv.	
16,360	20.	6,036 00	Mississippi Riv.	
13,820				
108,700	18.95	20,598 65	Mississippi Riv.	
167,753	14.	23,485 42	Mississippi Riv.	
422,503	.....	$73,004 39		
132,085	.....	23,056 56		
290,418	.....	$49,947 83		
.....	.....	.....	.....	Average price 17.19 cents per cubic yard
42,801	.....	$ 5,992 14		
89,284	.....	17,064 42		
132,085	.....	$23,056 56		

APPENDIX A. STATEMENT

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
			PONTCHARTRAIN LEVEE			
14	Southwood	Ascension	Nov. 10, 1899	June 16, 1900	.....	16,498
15	Linwood	Ascension	Dec. 14, 1900	Apr. 4, 1902	.....	14,603
16	Southport	Jefferson	Oct. 3, 1900	Apr. 9, 1901	1,592	.....
	Section Macedonia Church	.....	.....	.....	.....	672
	Elevator	.....	.....	.....	.....	1,268
	Totals	.....	.....	.....	1,592	33,041
	Less amount done previous to April 20, 1900		.....	.....	.....	12,790
	Work done from April 20, 1900, to April 21, 1902		.....	.....	1,592	20,251
					or 0.30 mls	or 3.83 mls
			LAFOURCHE BASIN LEVEE			
17	Whitney to Stevenson	St. John	Mar. 29, 1901	Mar. 17, 1902	.....	10,797
18	Marrero	Jefferson	Oct. 17, 1900	Jan. 22, 1901	1,022	.....
19	Coulon to Greenwood	Lafourche	Aug. 6, 1901	Apr. 8, 1902	4,662	.....
	Section Baptiste Aucoin	.....	.....	.....	3,882	200
	Work done from April 20, 1900, to April 21, 1902		.....	.....	9,566	10,997
					or 1.81 mls	or 2.08 mls
	The above is divided by streams as follows:					
	On the Mississippi River		.....	.....	0.20 mls	2.04 mls
	On Bayou Lafourche		.....	.....	1.61 mls	0.04 mls
	Totals		.....	.....	1.81 mls	2.08 mls
			LAKE BORGNE BASIN LEVEE			
20	Harlem	Plaquemines	Nov. 2, 1900	Mar. 10, 1902	1,346	8,907
	Section Bellevue	.....	.....	.....	2,416	1,365
	Work done from April 20, 1900, to April 21, 1902		.....	.....	3,762	10,272
					or 0.71 mls	or 1.94 mls

No. 1—Continued. STATE CONTRACTS.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT				
76,951	20.	$15,390 20	Mississippi Riv.	
56,097	18.75	10,518 18	Mississippi Riv.	
51,105	17.40	10,546 66	Mississippi Riv.	
3,245				
6,263				
193,661	.....	$36,455 04		
62,297	.....	12,458 40		
131,364	.....	$23,996 64		
.....	.....	.....	.....	Average price 18.27 cents per ucbic yard
DISTRICT				
78,569	11.94	$9,381 13	Mississippi Riv.	
22,993	18.50	4,253 70	Mississippi Riv.	
99,188	15.07	29,961 20	Bayou Lafourche	
89,544				
290,294	.....	$43,596 03		
.....	.....	.....	.....	Average price 15.02 cents per cubic yard
101,562	.....	$13,634 83		
188,732	.....	29,961 20		
290,294	.....	$43,596 03		
DISTRICT				
40,841	13.95	$9,878 55	Mississippi Riv.	
29,973				
70,814	.....	$9,878 55		
.....	.....	.....	.....	Average price 13.95 cents per cubic yard

APPENDIX A. STATEMENT

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
			GRAND PRAIRIE LEVEE			
21	Waltzer	Plaquemines	Oct. 17, 1900	Jan. 16, 1901	1,630	.....
22	Nestor Canal to Burton	Plaquemines	July 31, 1901	Feb. 19, 1902	2,145	4,600
	Section Zettwock	.....	.....	.....	1,436	1,089
23	Point Pleasant and below	Plaquemines	Oct. 17, 1900	Jan. 30, 1901	6,892	1,560
24	Polites Canal	Plaquemines	Oct. 1, 1901	Feb. 19, 1902	305	.....
25	Basil to Brophy	Plaquemines	July 31, 1901	Dec. 20, 1901	1,100	.....
26	Brophy to Bicks	Plaquemines	Oct. 1, 1901	Feb. 19, 1902	3,130	.....
27	Bicks to O'Brien	Plaquemines	Oct. 1, 1901	Dec. 20, 1901	1,740	.....
28	Arms	Plaquemines	July 31, 1901	Dec. 20, 1901	600	.....
29	Arms Extension	Plaquemines	Oct. 1, 1901	Dec. 20, 1901	1,892	.....
30	Moran	Plaquemines	Oct. 1, 1901	Dec. 20, 1901	1,330	.....
	Work done from April 20,	1900, to April 21,	1902	.....	22,190 or 4.20 mls	7,249 or 1.37 mls
			BURAS LEVEEE			
31	John Bowers	Plaquemines	Oct. 17, 1900	Jan. 30, 1901	3,688	.....
32	Louderbough to Hays	Plaquemines	July 31, 1901	Feb. 19, 1902	2,040	.....
33	Buras Church	Plaquemines	Oct. 8, 1901	Feb. 19, 1902	688	.....
34	Fort Jackson to Booth	Plaquemines	Oct. 8, 1901	Dec. 20, 1901	.....	13,361
35	Booth to Leon Buras	Plaquemines	Oct. 8, 1901	Jan. 20, 1902	5,785	8,500
36	Leon Buras to Venice	Plaquemines	Oct. 8, 1901	Nov. 26, 1901	3,125	3,710
	Work done from April 20,	1900, to April 21,	1902	.....	15,326 or 2.90 mls	25,571 or 4.84 mls
			CADDO LEVEE			
37	Lower Section Scott Slough to Sale and Murphy Canal	Caddo	Apr. 23, 1901	Feb. 12, 1902	5,334	.....
38	Thompson	Caddo	Oct. 30, 1900	Mar. 1, 1901	3,700	.....
39	Cairo to Soda Fountain	Caddo	Dec. 15, 1899	Aug. 11, 1900	16,592	2,835
	Totals	.....	.....	.....	25,626	2,835
	Less amount done previo	us to April 20, 19	00	.....	9,992	.....
	Work done from April 20,	1900, to April 21,	1902	.....	15,634 or 2.96 mls	2,835 or 0.53 mls

No. 1.—Continued. STATE CONTRACTS.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT				
9,538	12 49	$1,191 29	Mississippi Riv.	
24,641	1330	4,897 72	Mississippi Riv.	
12,184				
26,981	12¼	3,327 65	Mississippi Riv.	
854	15½	132 37	Mississippi Riv.	
4,454	14¼	638 40	Mississippi Riv.	
11,832	14½	1,695 92	Mississippi Riv.	
7,233	14.24	1,029 97	Mississippi Riv.	
3,142	13.30	417 88	Mississippi Riv.	
8,894	13.50	1,200 69	Mississippi Riv.	
5,995	13.50	809 32	Mississippi Riv.	
115,748	.....	$15,341 21		
.....	.....	.....	.....	Average price 13.25 cents per cubic yard
DISTRICT				
25,455	12¼	$3,139 45	Mississippi Riv.	
15,427	14⅔	2,262 62	Mississippi Riv.	
5,707	17¼	989 21	Mississippi Riv.	
15,670	17.	2,663 90	Mississippi Riv.	
26,382	19⅔	5,188 46	Mississippi Riv.	
8,518	25.	2,129 50	Mississippi Riv.	
97,159	.....	$16,373 14		
.....	.....	.....	.....	Average price 16.85 cents per cubic yard
DISTRICT				
112,933	17.64	$19,921 38	Red River	
41,385	12.70	5,255 89	Red River	
166,314	10.	16,631 40	Red River	
320,632	.....	$41,808 67		
100,134	.....	10,013 40		
220,498	.....	$31,795 27		
.....	.....	.....	.....	Average price 14.41 cents per cubic yard

APPENDIX A. STATEMENT

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
			BOSSIER LEVEE			
40	Willow Bend	Bossier	Jan.15, 1902	.....	.....	8,000
41	Ogden	Bossier	Nov. 7, 1900	Mar. 1, 1901	5,000	.....
42	Dillard	Bossier	Dec. 15,1899	June11,1900	6,517	.....
43	Vinson	Bossier	Jan. 20,1902	Apr.19,1902	4,224	.....
44	Sunny Point	Bossier	Oct. 24, 1901	Mar. 5, 1902	3,124	.....
45	Bear Point	Bossier	Feb. 28,1900	June28,1900	6,200	.....
	Totals				25,065	8,000
	Less amount done previous to April 20, 1900, and not completed April 21, 1902				7,217	5,300
	Work done from April 20, 1900, to April 21, 1902				17,848 or3.38mls	2,700 or0 51ml.
	Amount deducted as above:					
	Work done previous to April 20, 1900.		.....	.....	7,217	.....
	Work not completed April 21, 1902		.....	.....	.....	5,300
	Total to be deducted		.....	.....	7,217	5,300
			RED RIVER, ATCHAFALAYA AND BAYOU BŒUF			
46	Alexandria Front	Rapides	Mar.29,1901	Oct. 15, 1901	.....	2,400
47	Glen Mary to Yellow Bayou	Avoyelles	Oct. 22,1901	.....	448	20,700
48	Simmsport South	Avoyelles	Oct. 3, 1900	Apr.22,1901	.....	10.370
	Totals				448	33.470
	Less amount not completed April 21, 1902		.....	.....	448	4,700
	Work done from April 20, 1900, to April 21, 1902		.....	.....	.....	28,770 or5.45mls
	The above is divided by streams as follows:					
	On Red River		.....	.....	.....	0.45 mile
	On Bayou des Glaizes		.....	.....	.....	3 03 mls.
	On Atchafalaya River		.....	.....	.....	1.97 mls.
	Totals		.....	.....	.....	5.45 mls.

No. 1—Continued. STATE CONTRACTS.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT				
61,000	14.40	$ 8,784 00	Red River	
38,571	10.70	4,127 09	Red River	
51,935	9.75	5,063 66	Red River	
30,715	14.40	4,422 96	Red River	
51,289	18.40	9,437 17	Red River	
71,023	11.20	7,954 57	Red River	
304,533	.....	39,789 45		
100,993	.....	12,162 66		
203,540	.....	$27,626 79		
.....	.....	.....	.....	Average price 13.57 cents per cubic yard
58,993	.....	6,114 66		
42,000	.....	6,048 00		
100,993	.....	$12,162 66		
LEVEE DISTRICT				
14,524	41.	$ 5,954 84	Red River	
83,000	16.5	13,695 00	Bayou des Glaizes	
53,780	17 ¾	9,381 62	Atchafalaya Ri.	
151,304	.....	$29,031 46		
20,000	.....	3,300 00		
131,304	.....	$25,731 46		
.....	.....	.....	.....	Average price 19.59 cents per cubic yard
14,524	.....	$ 5,954 84		
63,000	.....	10,395 00		
53,780	.....	9,381 62		
131,304	.....	$25,731 46		

APPENDIX A. STATEMENT

RECAPITULATION

DISTRICT	MILES	
	New Levee	Enlargement
Fifth Louisiana Levee District	3.98	1.18
Atchafalaya Basin Levee District	.....	8.42
Pontchartrain Levee District	0.30	3.83
Lafourche Basin Levee District	1.81	2.08
Lake Borgne Basin Levee District	0.71	1.94
Grand Prairie Levee District	4.20	1.37
Buras Levee District	2.90	4.84
Caddo Levee District	2.96	0.53
Bossier Levee District	3.38	0.51
Red River, Atchafalaya and Bayou Bœuf Levee District	.....	5.45
Totals	20.24	30.15

No. 1—Continued. STATE CONTRACTS

Cubic Yards	Average Price—Cents	Cost	REMARKS
580,432	15.13	$ 87,831 61	
290,418	17.19	49,947 83	
131,364	18.27	23,996 64	
290,294	15.02	43,596 03	
70,814	13.95	9,878 55	
115,748	13.25	15,341 21	
97,159	16.85	16,373 14	
220,498	14.41	31,795 27	
203,540	13.57	27,626 79	
131,304	19.59	25,731 46	
2,131,571	15.58	$332,118 53	

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Tensas
1900, to April

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Brooksfield to Opossum Fork	Desha Co., Ark.	Sep. 27,1900	May 17,1901	.....	31,742
2	Lucca Loop, Sta. 3880 -/- 21 to 413	" " "	Aug. 5,1901	Jan. 27,1902	.....	.....
	Sta. 413 to 438	" " "	July 30,1901	Feb. 17,1902	.....	.....
	" 438 to 462	" " "	July 25,1901	Jan. 2, 1902	.....	.....
	" 462 to 483 -/- 75	" " "	July 18,1901	Jan. 8, 1902	.....	.....
3	Arkansas City Repair	" " "	.....	July 5, 1900	.....	43,700
4	Belcoe Loop	" " "	Oct. 10, 1900	May 15,1901	2,675	.....
					2,675	75,442
	Less amount paid by Red	Fork Levee Boa	rd	.....	.....	.....
	Work done from April 20,	1900, to April 21,	1902.....	.....	2,675 or 0.50 ml.	75,442 or 14.29 mls
	The above is divided by s	treams as follow	s:			
	On the Mississippi Ri	ver	.....	.....	.....	14.29 mls
	On the Arkansas Riv	er	.....	.....	0.50 ml.	.....
	Totals	.....	.....	.....	0 50 ml.	14.29 mls
	In addition to the above t	he Levee Board	has expend	ed for repa	ir work,	weed cutt

NOTE—The number of cubic yards given in the foregoing statement is based upon for the levees named, and the cost is obtained by applying the price per cubic yard bid by the Levee Commissioners.

No. 2. TENSAS BASIN LEVEE DISTRICT.

Basin Levee District, under four contracts entered into from April 20, 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
175,390	21.	$36,831 90	Mississippi Riv.	
.....	15.99	11,339 96	" "	"Linear feet" and "cubic yards" in statement No. 13 United States work.
.....	18 ½	10,573 08	" "	
.....	20 $\frac{8}{10}$	19,550 74	" "	
.....	22.	18,504 68	" "	
.....	.....	2,547 00	" "	
74,302	13 ½	10,030 77	Arkansas River	
249,692	.....	$109,378 13		
.....	.....	5,042 98	.....	On Belcoe Loop.
249,692	.....	$104,335 15		
.....	.....	.....	.....	Average price 18.75 (exclusive of Lucca Loop) per cubic yard.
175,390	.....	$99,347 36		
74,302	.....	4,987 79		
249,692	.....	$104,335 15		
ing etc..	.....	$3,191 68		

the list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Levee Commissioners of into from April 20, 1900, to April 21, 1902, with one contract of earlier

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Phil McGuire Extension	East Carroll		June 11, 1901	.....	8,106
2	Phil McGuire	" "	Aug. 27, 1900	Apr. 2, 1901	.....	6,191
3	Cohn	" "	Aug. 27, 1900	Apr. 2, 1901	.....	1,870
4	Hugh McGuire	" "	Aug. 27, 1900	Apr. 2, 1901	.....	2,984
5	Haggaman	" "	Aug. 27, 1900	Apr. 2, 1901	.....	1,575
6	Homestead	" "	Sep. 4, 1900	Sep. 9, 1901	.....	10,400
7	Transylvania	" "	Sep. 4, 1900	June 11, 1901	.....	2,445
8	Stambaul	" "	Sep. 4, 1900	June 11, 1901	.....	6,090
9	Atherton	" "	Apr. 18, 1901	June 6, 1901	.....	8,775
10	Pecantrove to Henderson	" "	Sep. 30, 1901		.....	9,343
11	Duckport	Madison	June 6, 1901	Apr. 1, 1902	5,517	.....
12	Killarney Loop No. 1	"		Apr. 2, 1902	868	.....
13	O'Brien to Martin	"	Aug. 27, 1900	Mar. 21, 1901	.....	7,252
14	Panola	Tensas		July 14, 1900	.....	3,400
15	Duckpond	"	Apr. 14, 1900	Jan. 15, 1901	.....	10,980
16	Harper to Stockridge	"			.....	16,577
17	Carter's to Vidalia	Concordia	Sep. 10, 1901		.....	20,222
18	Vidalia	"	Jan. 19, 1901	June 5, 1901	1,033	2,403
19	Vidalia Extension	"		July 26, 1901	.....	1,362
20	Vidalia Enlgmt. R. R	"				1,200
21	Vidalia to Moro	"	Sep. 10, 1901		3,498	44,657
22	Upper Green	"	Sep. 10, 1901			11,203
	" " Fairview Sec.	"			4,230	
	Totals				15,146	185,355
	Less work done previous to April 20, 1900, and not completed April 21, 1902					20,903
	Work done from April 20, 1900, to April 21 1902				15,146 or 2.87 mls	164,452 or 31.14 mls
	Amounts deducted as above:					
	Work done previous to April 20, 1900					1,460
	Work not completed April 21, 1902					19,443
	Total to be deducted					20,903

In addition to the above the Levee Board has expended:

For repair work, weed cutting, etc.	$ 6,542 45
High water protection work	150 54
For building ramps	303 60
For drain canals and ditches	2,467 27
	$ 9,523 85

No. 3. FIFTH LOUISIANA LEVEE DISTRICT.

the Fifth Louisiana Levee District under twenty-one contracts entered date, not completed April 20, 1900.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
98,327	$16\frac{7}{10}$	$ 16,420 60	Mississippi Riv.	
20,680	$16\frac{7}{10}$	3,453 56	" "	
12,396	$16\frac{7}{10}$	2,070 13	" "	
19,153	$16\frac{7}{10}$	3,198 55	" "	
3,409	$16\frac{7}{10}$	569 30	" "	
59,550	14.	8,337 00	" "	
12,805	17.	2,176 85	" "	
34,066	16.	5,450 56	" "	
38,545	$11\frac{74}{100}$	4,525 18	" "	
58,273	$12\frac{90}{100}$	7,558 00	" "	
110,275	10.	11,027 50	" "	
12,372	$12\frac{19}{100}$	1,508 14	" "	
29,689	$23\frac{1}{2}$	6,976 91	" "	
2,399	18.	431 82	" "	
20,129	13.	2,616 77	" "	
38,143	13.	4,958 59	" "	
112,285	30.	33,685 50	" "	
103,486	12.	12,418 32	" "	
21,047	13.	11,742 31	" "	
25,732	35.			
16,653	13.	2,168 79	" "	
13,000	15.	1,950 00	" "	
146,811	11.	17,249 21	" "	Completed, final certificate not issued
52,321	15.40	8,057 43	" "	
63,164	15.40	9,727 25	" "	
1,134,740	.....	$168,278 27		
139,815	.....	22,901 09		
994,925	.....	$145,377 18		
.....	.....	.....	.....	Average price 14.61 cents per cubic yard
9,192	.....	1,301 96		
130,623	.....	21,599 13		
139,815	.....	$22,901 09		

NOTE.—The number of cubic yards given in the foregoing statement is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Levee Commissioners of into from April 20, 1900, to April 21, 1902, with one contract of earlier

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Phil McGuire Extension.	East Carroll....	.....	June11,1901	.....	8,106
2	Phil McGuire.....	" "	Aug.27,1900	Apr. 2, 1901	.....	6,191
3	Cohn	" "	Aug.27,1900	Apr. 2, 1901	.....	1,870
4	Hugh McGuire.....	" "	Aug.27,1900	Apr. 2, 1901	.....	2,984
5	Haggaman	" "	Aug.27,1900	Apr. 2, 1901	.....	1,575
6	Homestead.....	" "	Sep. 4, 1900	Sep. 9, 1901	.....	10,480
7	Transylvania	" "	Sep. 4, 1900	June11,1901	.....	2,445
8	Stamboul	" "	Sep. 4, 1900	June11,1901	.....	6,090
9	Atherton	" "	Apr. 18,1901	June6, 1901	.....	8,775
10	PecanGrove to Henderson	" "	Sep. 30,1901	.....	.....	9,343
11	Duckport	Madison	June 6, 1901	Apr. 1, 1902	5,517	.....
12	Killarney Loop No. 1....	"	.....	Apr. 2, 1902	868	.....
13	O'Brien to Martin.....	"	Aug.27,1900	Mar.21,1901	.....	7,252
14	Panola	Tensas.....	.....	July 14,1900	.....	3,400
15	Duckpond.....	"	Apr.14,1900	Jan. 15,1901	.....	10,950
16	Harper to Stockridge.....	"	.....	.....	.....	16,577
17	Carter's to Vidalia.....	Concordia.....	Sep.10, 1901	.....	.....	28,222
18	Vidalia.....	"	Jan. 19,1901	June 5, 1901	1,033	2,483
19	Vidalia Extension.....	"	.....	July26, 1901	.....	1,362
20	Vidalia Enlgmt. R. R....	"	.....	.....	.....	1,200
21	Vidalia to Moro	"	Sep. 10,1901	.....	3,498	44,057
22	Upper Green.....	"	Sep. 10,1901	.....	.....	11,393
	" " Fairview Sec.	"	.....	.....	4,230	.....
	Totals.....	.....	.....	.....	15,146	185,355
	Less work done previous	to April 20, 1900,	and not co	mpleted		
	April 21, 1902.....	.....	.....	.....	.....	20,903
	Work done from April 20,	1900, to April 21.	1902.....	.....	15,146	164,452
					or2.87mls	or31.14 mls
	Amounts deducted as abo	ve;				
	Work done previous t	o April 20, 1900..	.....	.....	.....	1,460
	Work not completed	April 21, 1902....	.....	.....	.....	19,443
	Total to be deducted	.....	.....	.....	.....	20,903

In addition to the above the Levee Board has expended:

For repair work, weed cutting, etc.....	$ 6,542 45
High water protection work.....	150 54
For building ramps.....	363 59
For drain canals and ditches	2,467 27
	$ 9,523 85

No. 3. FIFTH LOUISIANA LEVEE DISTRICT.

the Fifth Louisiana Levee District under twenty-one contracts entered dat-, not completed April 20, 1900.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
98,327	$16\frac{7}{10}$	$ 16,420 60	Mississippi Riv.	
20,680	$16\frac{7}{10}$	3,453 56	" "	
12,396	$16\frac{7}{10}$	2,070 13	" "	
19,153	$16\frac{7}{10}$	3,198 55	" "	
3,409	$16\frac{7}{10}$	569 30	" "	
59,550	14.	8,337 00	" "	
12,805	17.	2,176 85	" "	
34,066	16.	5,450 56	" "	
38,545	$11\frac{74}{100}$	4,525 18	" "	
58,273	$12\frac{94}{100}$	7,558 00	" "	
110,275	10.	11,027 50	" "	
12,372	$12\frac{18}{100}$	1,508 14	" "	
29,689	$23\frac{1}{2}$	6,976 91	" "	
2,399	18.	431 82	" "	
20,129	13.	2,616 77	" "	
38,143	13.	4,958 59	" "	
112,285	30.	33 685 50	" "	
103,486	12.	12,418 32	" "	
21,047	13.	11,742 31	" "	
25,732	35.			
16,683	13.	2,168 79	" "	
13,000	15.	1,950 00	" "	
146,811	11.	17,249 21	" "	Completed, final certificate not issued
52,321	15.40	8,057 43	" "	
63,164	15.40	9,727 25	" "	
1,134,740	.....	$168,278 27		
139,815	.....	22,901 09		
994,925	.....	$145,377 18		
.....	.....	.....	.....	Average price 14.61 cents per cubic yard
9,192	.....	1,301 96		
130,623	.....	21,599 13		
139,815	.....	$22,901 09		

NOTE.—The number of cubic yards given in the foregoing statement is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Atchafa April 20, 1900, to April 21 1902, with six contracts,

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Barbers	Pointe Coupee	Mar. 5, 1900	May 10, 1900	500	.....
2	Dameron & White Dist.					
	Section No. 1				.....	9,202
	Limerick				1,400	.....
	Elba				1,910	3,240
	Soulouque	.....	Jan. 3, 1900	Jan. 3, 1901	1,572	5,401
	Section A				.....	49,413
	Section B				800	25,453
	Section C				320	30,055
3	Dameron & White, 1901					
	Section No. 1				333	900
	Raccourci to Longwood				.....	16,000
	Pt. Manoir to Highland	.....	Jan. 3, 1901	Jan. 3, 1902	.....	14,240
	Solitude				750	.....
	Lobdell				.....	3100
	Limerick				1,590	.....
	Section A				.....	680
4	Evergreen	Iberville	Apr. 26, 1899	July 5, 1900	5,010	.....
5	Dameron & White, 1902					
	Raccourci to Longwood				.....	980
	Lobdell				.....	4630
	Solitude	.....	Jan. 3, 1902	.....	7,965	.....
	Bayou Goula				.....	4029
	Oakley				684	.....
	Belmont Church				.....	3690
6	Atchafalaya River	Pointe Coupee	Jan. 14, 1901	Feb. 4, 1902	14,471	19,963
7	Atchafalaya River, 1902	Pointe Coupee	Feb. 4, 1902	.....	19,700	.....
8	St. Rose	Lafourche	Jan. 8, 1900	July 2, 1900	5,205	696
9	Foret, completion	Lafourche	Jan. 18, 1900	Dec. 31, 1900	.....	.....
10	Lafourche, enlargement	.....	Apr. 22, 1896	June 11, 1900	7,273	146,752
	Totals	.....	.....	.....	69,483	338,424
	Less work done previous	to April 20, 1900,	and not co	mpleted		
	April 21, 1902	.....	.....	.....	34,517	155,875
	Work done from April 20,	1900, to April 21,	1902	.....	34,966	182,549
					or 6.62 mls	or 34.57 mls
	The above is divided by	streams as follo	ws:		miles	miles
	Mississippi River	.....	.....	.....	1.92	9.74
	Atchafalaya River	.....	.....	.....	4.70	23.79
	Bayou Lafourche	.....	.....	.....	.....	1.04
					6.62	34.57
	Amounts deducted as abo	ve:				
	Work done previous to	April 20, 1900	.....	.....	17,350	149,538
	Work not completed,	April 21, 1902	.....	.....	17,167	6,337
					34,517	155,875

In addition to the above the Levee Board has expended the following:

For repair work, weed cutting, etc	$11,692 39
For drain canals and ditches	3,487 35
Total	$15,179 74

No. 4. ATCHAFALAYA BASIN LEVEE DISTRICT.

laya Basin Levee District, under four contracts, entered into from of earlier date not completed April 20, 1900.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
4,686	15.	$ 702 90	Mississippi Riv.	
51,556		7,802 13	" "	
38,233		6,414 20	" "	
74,631		12,026 42	" "	
67,954	Scale	10,125 39	" "	
362,415		61,735 71	Atchafalaya Ri.	
194,975		32,147 84	" "	
276,774		47,411 56	" "	
9,304		1,257 00	Mississippi Riv.	
125,126		26,747 48	" "	
119,133	Scale	23,059 86	" "	
33,518		6,710 45	" "	
29,040		5,993 56	" "	
44,288		7,488 67	" "	
4,600		718 02	Atchafalaya Ri.	
229,681	14 7/10	33,763 10	Mississippi Riv.	
12,455		2,606 94	" "	
39,467		8,763 03	" "	
392,536	Scale	89,254 84	" "	
19,730		3,303 94	" "	
15,261		3,052 20	Lafourche Bay.	
15,934		2,151 09	" "	
410,334	Scale	59,355 57	Atchafalaya Ri.	
260,000	19.	49,400 00	" "	
130,124	13.	16,916 12	Lafourche Bay.	
1,609	12.	193 08	" "	
1,181,654	16.	189,064 64	" "	
4,145,018	.....	$708,165 74		
2,044,535	.....	353,226 55		
2,100,483	.....	$354,939 19		
.....	.....	.....	.....	Average price 16.89 cents per cubic yard
741,614	.....	$137,599 45		
1,310,898	.....	210,236 70		
47,971	.....	7,103 04		
2,100,483	.....	$354,939 19		
1,531,405	.....	$243,573 69		
513,130	.....	109,652 86		
2,044,535	.....	$353,226 55		

NOTE—The number of cubic yards given in the foregoing statement is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Pont-
April 20, 1900, to

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Elevator	Jefferson		Apr. 9, 1901		
2	Southport to Upper Line.	"	Feb. 28, 1901	Apr. 9, 1901		
	Work done from April 20, 1900, to April 21, 1902					

In addition to the above the Levee Board has expended the following:

For repair work, weed cutting, etc.	$ 3,428 27
For revetment or other protection work	1,795 15
For drain canals and ditches	240 15
Total	$ 5,463 57

No. 5. PONTCHARTRAIN LEVEE DISTRICT.

chartrain Levee District, under two contracts entered into from April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
6,263	12.6	$ 789 13	Mississippi Riv.	
.....	.....	1,529 19	" "	
6,263	.....	$2,318 32		

NOTE.—The number of cubic yards given in the foregoing statement is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the April 20. 1900, to April 21, 1902, with one contract of

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Miss. River and Bayou Lafourche Extension					
	Barrois				2,036	.....
	Section No. 4	.....	Jan. 2, 1900	Mar. 1, 1901	8,798	3,781
	Sweet Home to Plattenville				2,363	13,957
	Section No 8				1,598	5,400
	Section No. 9				1,864	.....
2	Donaldsonville to Company Canal					
	Cofield				1,900	.....
	Perret Section				1,645	.....
	Roger Valle	.....	Mar. 5, 1901	Mar. 4, 1902	1,610	.....
	Louisa				.....	2,955
					1,725	.....
	Avondale				.....	3,268
	Orange Grove				1,360	.....
					.....	2,875
3	Donaldsonville to Company Canal, 1902					
	Cofield				722	4,149
	Avondale	.....	Mar. 5, 1902	.....	2,290	.....
	Plattenville Down				.....	8,605
	Tete's to Aucoin				.....	3,969
4	Crescent	.....	.....	.....	558	.....
	Totals	.....	.....	.....	28,469	48,959
	Less work done previous to April 20, 1900, and not completed April 21, 1902	.....	.....	.....	5,752	19,324
	Work done from April 20, 1900, to April 21, 1902	.....	.....	.....	22,717	29,635
					or4.30mls	or5.61mls
	The above is divided by streams as follows:				miles	
	Mississippi River	.....	.....	.....	2.08	1.72
	Bayou Lafourche	.....	.....	.....	2.22	3.89
					4.30	5.61
	Amount deducted as above:					
	Work done previous to April 20, 1900	.....	.....	.....	3,462	6,174
	Work not completed April 21, 1902	.....	.....	.....	2,290	13,150
					5,752	19,324

In addition to the above the Levee Board has expended the following:

For repair work, weed cutting, etc.	$ 20,882 70
For revetment or other protection work	14,632 22
	$ 35,514 92

No. 6. LAFOURCHE BASIN LEVEE DISTRICT.

Lafourche Basin Levee Board, under three contracts entered into from earlier date, not completed April 20, 1900.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
29,486	Scale	$ 4,549 49	Mississippi Riv.	
219,084		37,926 21	Bay. Lafourche	
97,518		15,334 03	" "	
55 686		9,283 72	" "	
43,350		7,880 41	" "	
41,959	Scale	7,493 46	Mississippi Riv.	
31,511		5,325 76	" "	
38,915		7,161 41	" "	
15,710		2,707 51	" "	
48,567		9,728 94	" "	
15,903		2,149 97	" "	
22,917		3,700 00	" "	
12,590		1,786 19	" "	
48,991	Scale	9,080 38	" "	
58,768		12,273 00	" "	
69,590		17,484 20	Bay. Lafourche	
21,648		4,955 14	" "	
8,660	12.	1,039 20	" "	
880,853	.....	$ 159,859 02		
395,499	.....	56,254 91		
585,354	.....	$ 103,604 11		
.....	.....	.....	.....	Averrge price 17.69 cents per cubic yard
271,567	.....	$ 47,258 62		
313,787	.....	56,345 49		
585,354	.....	$ 103,604 11		
129,991	.....	$ 19,577 53		
165,508	.....	36,677 38		
295,499	.....	$ 56,254 91		

NOTE—The number of cubic yards given in the foregoing statement is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Grand
20, 1900, to

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Zettwock	Plaquemines	.....	Mar. 1, 1901	160	.....
2	New Canal	Plaquemines	Nov. 25, 1901	Jan. 27, 1902	2,519	1,000
	Work done from April 20,	1900, to April 21.	1902	.....	2,679 or 0.50 mi.	1,000 or 0.18 mi.

In addition to the above the Levee Board has expended the following:

For repair work, weed cutting, etc	$1,755 77
For revetment or other protection work	4,005 21
For high water protecti n work	48 20
	$5,809 18

The Board of Commissioners for the Lake Borgne Basin Levee District did in work by contract, but expended the following:

For cleaning levees, weed cutting, etc	$1,436 80
For revetment or other protection work	3,426 45
For building ramps	2,269 60
For drain canal and ditches	2,218 96
	$9,351 81

No. 7. GRAND PRAIRIE LEVEE DISTRICT.

Prairie Levee District, under two contracts entered into from April April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
677	.....	$ 91 39	Mississippi Riv.	
6,609	13½	892 21	" "	
7,286	.....	$983 60		
.....	.....	.....	.....	Average price 13.49 cents per cubic yard.

The Board of Commissioners for the Buras Levee District did no work by contract, but expended the following:

For repair work, weed cutting, etc	$2,365 31
For revetment or other protection work	5,511 31
For high water protection	830 00
	$8,706 62

NOTE—The number of cubic yards given in the foregoing statement is based upon list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Caddo to April

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Upper Section Scott Slough to Sale and Murphy Canal	Caddo	May 22,1901	Apr. 18,1902	10,973	.....
2	Sale and Murphy Canal Dyke	Caddo	Sep. 18,1901	Apr. 18,1902	.....	685
	Work done from April 20, 1900, to April 21, 1902		.....	.....	10,973 2.08 mls	685 0.13 ml

In additional to the above the Levee Board has expended the following:

For repair work, weed cutting, revetment, or other protection work	$677 05
For drain canals and ditches	39 04
	$716 09

The Board of Commissioners for the Bossier Levee District did no work by contract, but expended the following:

For repair work, weed cutting, etc $1,239 35

No. 8. CADDO LEVEE DISTRICT.

Levee District, under two contracts entered into from April 20, 1900, 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
158,459	18.21	$28,855 38		
2,729	22.	600 38		
161,188	.....	$29,455 76		
.....	.....	.....	.....	Average price 18.27 cents per cubic yard

NOTE—The number of cubic yards given in the foregoing statement is based upon list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT No. 9. RED RIVER, AT

Levee work undertaken by the Board of Commissioners for the Red contracts entered into from April 20, 1900 to April 21, 1902,

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Alexandria Front	Rapides	Feb. 27,1901	Apr. 11,1901	.....	176
2	Alexandria Front Banquette	"	Mar.27,1901	Apr. 11,1901	.....	580
3	Gray to Boridino	Avoyelles	June 6, 1900	Oct. 27,1900	6,435	9,915
4	Upper Bayou des Glaizes.	"	Aug, 3, 1899	Aug. 3, 1900	23,700	.....
5	Rusk to Marshall	"	Dec. 8, 1900	Aug.16,1901	.....	26,560
6	Mill Bayou to Glenmary.	"	Feb. 19,1902	.....	.....	19,600
7	Yellow Bayou to Simsport	"	June 6, 1900	Apr.19,1 02	1,427	15,009
8	Simon Block to Winn Tract	"	Mar.27,1901	Aug.27,1901	.....	14,130
9	Winn Tract to Cason	"	Mar.27,1901	Sep. 23,1901	.....	14,595
10	Cason to Woodside	"	Mar.27,1901	Dec. 2, 1901	.....	11,306
11	Woodside to Home Place.	Avoyelles and St. Landry	Mar.27,1901	Aug.22,1901	.....	9,695
12	Home Place to Mansil Richard	St. Landry	Mar.27,1901	Aug.22,1901	.....	18,189
13	Bayou Current	"	June 6, 1900	Nov. 8, 1900	.....	5,988
14	Mansil Richard to Scotland	"	Mar.27,1901	Aug.22,1901	513	10,790
15	Scotland to Bayou Rouge	"	Mar.27 1901	Nov.19 1901	397	15,458
16	Bayou Rouge to Melville	"	Mar.27,1901	Mar.24,1902	.....	17,164
17	Melville to Bayou Petite Prairie	"	Mar.27,1901	.....	15,921	700
18	Bayou Petite Prairie	"	Aug.23,1900	May 22,1901	3,650	.....
19	Bayou Petite Prairie Dyke	"	.....	Dec. 9, 1901	.....	.....
	Totals				52,043	189,855
	Less amount done previous to April 20, 1900, and not completed April 21, 1902				26,300	3,355
	Work done from April 20, 1900, to April 21, 1902				25,743 or 4.87 mls	186,500 or 35.32 m's
	The above is divided by streams as follows:				miles	miles
	Red River				.....	0.14
	Bayou des Glaizes				1.49	12.83
	Atchafalaya River				3.38	22.35
	Totals				4.87	35.32
	Amounts deducted as above:					
	Work done previous to April 20, 1900				23,700	.....
	Work not completed April 21, 1902				2,600	3,355
	Totals				26,300	3,355

In addition to the above the Levee Board has expended the following:

For repair work, weed cutting, etc	$1,904 87
For building ramps	181 47
	$2,086 34

CHAFALAYA AND BAYOU BŒUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Bœuf Levee District, under eighteen with one contract of earlier date not completed April 20, 1900.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
2,113	50.	$1,056 50	Red River	
1,132	50.	566 00	" "	
60,824	9.7	5,899 93	Bay. des Glaizes	
94,412	9.24	8,723 66	" " "	
70,784	10.2	7,219 96	" " "	
70,000	18.80	13,160 00	" " "	
168,172	13.97	23,496 42	" " "	
85,405	11.45	9,778 87	Atchafalaya Riv	
86,098	11.70	10,073 46	" "	
49,738	12.73	6,331 64	" "	
72,947	10.97	8,002 29	" "	
69,130	12.70	8,779 51	" "	
27,814	14.97	4,163 76	" "	
60,935	10.97	6,684 56	" "	
83,702	11.47	9,600 61	" "	
121,794	10.74	13,080 67	" "	
225,000	21.7	.....	" "	
84,257	32.	26,962 24	" "	
.....	.....	1,190 37		
1,434,277	.....	$164,770 45		
170,128	.....	25,074 62		
1,264,149	.....	$139,695 83		
.....	.....	.....	.....	Average price 11.05 cents per cubic yard
3,245	.....	$1,622 50		
356,064	.....	46,879 35		
904,840	.....	91,193 98		
1,264,149	.....	$139,695 83		
92,128	.....	$8,612 62		
78,000	.....	16,462 00		
170,128	.....	$25,074 62		

NOTE—The number of cubic yards given in the foregoing statement is based upon list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT No. 10. RED RIVER, AT

Drainage work undertaken by the Board of Commissioners of the Red
tracts entered into from April

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET Earthwork	LINEAR FEET Enlargement Clearing
1	Bayou Lamourie Dam....	Rapides.....	.....	Apr. 1, 1901	200	.....
2	Aleandria to Chatlin Lake	"	Sep. 6, 1901	.....	76,560	76,560
3	Three Prong Lake to Bayou des Glaizes.....	Avoyelles.....	Feb. 7, 1901	.....	91,344	76,744
4	Mill Bayou to Bayou Rouget.....	"	Feb. 7, 1901	.....	52,800	52,800
5	Bayou Rouget to Turner Bayou.....	"	.....	.....	21,200	5,280
6	Turners Bayou to Bayou Jack	Avoyelles and St. Landry....	Feb. 7, 1901	.....	13,200	13,200
	Totals	.....	.....	.....	255,304	224,584
	Less amounts not completed April 21, 1902		.....	.....	178,994	119,248
	Work done from April 20, 1900, to April 21, 1902		.....	.....	76,310 14.45 mls	105,336 19.95 mls

NOTE—The number of cubic yards given in the foregoing statement is based upon works named, and the cost is obtained by applying the price per cubic yard bid for the Levee Commissioners.

CHAFALAYA AND BAYOU BŒUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Bœuf Levee District, under six con-
20 1900, to April 21, 1902.

Cubic Yards	Price—Cents	Cost	REMARKS
3,456	39.	$ 1,347 84	
467,000	9.95	61,556 50	Includes $15,090.00 for clearing.
670,000	8.50	83,250 00	Includdes $26,300.00 for clearing.
200,000	9.	31,270 00	Includes $13,270.00 for clearing.
50,000	9.	6,000 00	Includes $1,500.00 for clearing.
70,000	9.	14,000 00	Includes $7,700.00 for clearing.
1,460,456	.....	$197,424 34	
998,000	.....	127,571 32	
462,456	.....	$69,853 02	

list of dimensions furnished and estimates made by the Board of State Engineers for the work, without regard to discount, interest, or other incidental expenses incurred by the

APPENDIX A. STATEMENT

The Board of State Engineers is indebted to Mr. Gervais Lombard, work undertaken by the Orleans Levee Board, under four

Number	NAME OF CONTRACT	PARISH	DATE OF		LINEAR FEET			
			Contract	Final Certificate	New Levee	Enlargement	Revetment	Pile Bank Protection
1	Joseph Street to Upper Line of Audubon Park	Orleans	Sep. 28,1899	Oct. 27, 1900	554	.....	554	.....
2	Protection to Short Street	Orleans	Sep. 6, 1900	Dec. 1, 1900	.....	4398	.....	.....
3	Repairing Pile Bank Protection Egania to Lesseps	Orleans	Oct. 9, 1900	Jan. 8, 1901	.....	.....	.....	300
4	Filling Pond at Bordeaux Street.	Orleans	Jan. 23,1901	.....	.....	.....	.....	.....
	Totals		.....	.....	554 0.10mi	4398 0.83mi	554	300

In addition to the above statement the district has expended $64,518.31 in general maintenance and repair work by day forces.

No. 11. ORLEANS LEVEE DISTRICT.

Engineer of the Orleans Levee District, for the following statement of contracts entered into from April 20, 1900, to April 21, 1902.

Price per Cubic Yard Earthwork	Price per 1000 Feet—B. M.	Price per Linear Feet of Piles	Number of Cubic Yards	Number of Feet B. M.	Number of Linear Feet of Piles	Total Cost	REMARKS
cents		cents					
14⅞	29.95	.....	11,187.4	51,487	.....	$3,328 02	This includes $121.80 for tile drains.
21.	.....	.....	12.030.9	.....	.....	2,526 49	
.....	30.00	23.	.....	142,644	36,056	8,263 80	This includes $96.60 for iron tie rods.
25.	.....	.....	400.0	.....	.....	100 00	
.....	.....	.....	23,618.3	194,131	36,056	$14,218 31	

APPENDIX A. STATEMENT

RECAPITULATION.

DISTRICT	MILES	
	New Levee	Enlargement
Tensas Basin Levee District	0.50	14.29
Fifth Louisiana Levee District	2.87	31.14
Atchafalaya Basin Levee District	6.62	34.57
Pontchartrain Levee District	.....	.....
Lafourche Basin Levee District	4.30	5.61
Grand Prairie Levee District	0.50	0.18
Caddo	2.08	0.13
Red River, Atchafalaya and Bayou Bœuf Levee District	4.87	35.32
Orleans	0.10	0.83
Totals	21.84	122.07
	MILES	
DRAINAGE.	Excav.	Clear
Red River, Atchafalaya and Bayou Bœuf Levee District	14.45	19.95

No. 12. DISTRICT CONTRACTS.

Cubic Yards	Average Price—Cents	Cost	REMARKS
249,692	18.76	$104,335 15	
994,925	14.61	145,377 18	
2,100,483	16.89	354,939 19	
6,263	12.60	2,318 32	
585,354	17.69	103,604 11	
7,286	13.49	983 60	
161,188	18.27	29,455 76	
1,264,149	11.05	139,695 83	
23,618	18.16	4,290 57	
5,392,958	15.27	$884,999 71	
462,456	.....	$69,853 02	

APPENDIX A. STATEMENT

The Board of State Engineers is indebted to the courtesy of Captain
lowing statement of levees built and enlarged by the United
from April 20, 1900,

Number	NAME OF CONTRACT Station to Station	PARISH or COUNTY	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
	IN ARKANSAS.					
	1240 to 1290	Desha Co.	Aug.22,1900	Apr. 8, 1901	.....	25,000
	2047 to 2100	Chicot "	Sep. 1, 1900	Feb. 1, 1901	.....	5,300
	2533 to 2562	" "	Aug.22,1900	Jan. 7, 1901	.....	2,900
	2562 to 2740	" "	Sep. 1, 1900	Mar.12,1902	.....	17.800
	732 to 785	Desha "	Dec. 22,1900	Feb. 8, 1902	5,300	.....
	2147 to 2533	Chicot "	Feb. 25,1901	Apr.17,1901	.....	38,600
	388x21 to 413	Desha "	Aug. 5, 1901	Jan. 27,1902	2,479	.....
	413 to 438	Desha Co.	July 30,1901	Feb.17,1902	2,500	.....
	438 to 462	" "	July 25,1901	Jan. 2, 1902	2,400	.....
	462 to 483x75	" "	July 18,1901	Jan. 8, 1902	2,175	.....
					14,854	89,600
					2.81 mls	16.96 mls
	Less amount paid by B'd	Com'rs Tensas	Basin Lev	ee Dist...	.....	.....
	IN LOUISIANA.	(Fifth Louisian	a Levee Di	strict.)		
	2480 to 2518	East Carroll Par	Sep. 1, 1900	Jan. 7, 1901	3,800	.....
	2480 to 2518	" " "	Sep. 1, 1900	Feb. 1, 1901	.....	3,800
	2519 to 2555	" " "	Sep. 1, 1900	Feb. 1, 1901	3,600	.....
	2556 to 2586	" " "	Sep. 1, 1900	Feb. 1, 1901	3,000	.....
	2587 to 2618	" " "	Sep. 1, 1900	Feb. 1, 1901	3,100	.....
	2587 to 2618	" " "	Sep. 1, 1900	Feb. 1, 1901	.....	3,100
	2619 to 2651	" " "	Sep. 1. 1900	Feb. 1, 1901	3,100	.....
	2652 to 2697	" " "	Sep. 1, 1900	Feb. 16,1901	4,500	.....
	2698 to 2752x44	" " "	Aug.22,1900	Apr.19.1901	5,444	.....
	2497 to 2570	" " "	Feb. 8, 1901	May 14,1901	.....	7,300
	4570 to 4619	Madison "	June18,1899	Aug. 3, 1900	.....	4,900
					26,544	19,100
					5.02 mls	3.61 mls

No. 13. UNITED STATES LEVEES.

Chas. L. Potter, Corps of Engineers, United States Army, for the fol- States, in the Upper Tensas District in Arkansas and Louisiana, to April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
117,657	12 6/10	$14,589 46	Mississippi Riv.	
46,136	18 7/10	8,627 43	" "	
39,392	22 4/100	8,843 50	" "	$4,485.50 paid for by U. S. $4,357.99 paid for by Chicot Co. Levee Board.
65,963	13 7/10	9,036 33	" "	
169,788	14 2/10	24,109 89	Arkansas River	
8,747	30.	2,624 10	Mississippi Riv.	Topping.
109,587	15 92/100	17,522 96	" "	$5,774 00 paid for by U. S. $11,339.96 paid for by Tensas Basin Levee Board, $409.00 paid by Chicot Co. Levee Board.
123,781	18¼	22,899 49	" "	$5,800.01 paid by U. S. $10,573.08 paid by Tensas Basin Levee Board. $6,526.40 paid by Chicot Co. Levee Board.
119,414	20 8/10	24,957 53	" "	$5,406.79 paid by U. S. $19,550.74 paid by Tensas Basin Levee Board.
115,091	22.	25,320 02	" "	$5,999.97 paid by U. S. $18,504.68 paid by Tensas Basin Levee Board. $815.37 paid by Chicot Co. Levee Board.
915,556	.....			
.....	.....	$158,530 71	.....	Average price 17.31 cents per cubic yard.
.....	.....	59,972 46		
		$98,558 25		
90,865	14.94	$13,575 23	Mississippi Riv.	
12,215	15.91	1,943 41	" "	Banquette.
188,345	15.61	29,400 65	" "	
174,972	17.61	30,812 57	" "	
166,224	16 21	26,944 91	" "	
4,361	16.91	737 44	" "	Banquette.
169,517	16.21	27,478 69	" "	
196,706	15¼	30,489 43	" "	
152,666	12.99	19,831 32	" "	
29,153	11 8/10	2,469 21	" "	
72,029	30¼	21,968 85	" "	Banquette.
1,257,053	.....	$205,651 71		
.....	.....	.....		Average price 16.36 cents per cubic yard.

APPENDIX A. STATEMENT No. 14.

UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Major Geo. McC. Derby, Corps of Engineers, United States Army, for the following statement of levees built and enlarged by the United States, in the Fourth District, improving Mississippi River, from opposite Warrenton, Miss., to head of Passes, from April 20, 1900, to April 21, 1902.

NAME OF LEVEE	Miles below Cairo	Length of Line	New or Enlargement	Date of Completion	Cubic Yards	Total Cost
Fifth Louisiana Levee District						
Stockridge—						
Section 1	659 R	1,629	Enlargmt.	April 16, 1901	15,139.47	
Section 2	659 R	1,400	"	April 16, 1901	14,593.58	
Section 3	659 R	1,400	"	April 16, 1901	15,706.89	
Section 4	659 R	1,300	"	April 16, 1901	14,625.69	
Waterproof, Lot 1—						
Section 1	663 R	1,100	"	July 6, 1901	14,101.23	
Section 2	663 R	1,100	"	Nov. 5, 1901	14.115.72	
Section 3	663 R	1,000	"	Dec. 16, 1901	13,259.76	
Waterproof, Lot 2—						
Section 1	663 R	1,000	"	Oct. 26, 1901	12,482.77	
Section 2	663 R	1,000	"	Sept. 18, 1901	12,350.94	
Section 3	663 R	998	"	Aug. 8, 1901	12,700.42	
Rifle Point—						
Section 2	689 R	4.200	"	April 10, 1901	43,010.38	
Grassmere—						
Section 1	691 R	2,059	"	Mar 21, 1901	14,565.82	
Section 2	691 R	1,900	"	Feb. 27, 1901	14,117.31	
Section 3	691 R	1,800	"	Feb. 8, 1901	15,102.59	
Lower Pittsfield—						
Section 1	691 R	1,400	"	Oct. 28, 1900	15,578.02	
Section 2	691 R	2,400	"	Oct 12, 1900	15.690.33	
Section 3	691 R	2,400	"	Dec. 1, 1900	15.418.93	
Section 4	691 R	1,700	"	Dec. 15, 1900	15,327.27	
Pittsfield—						
Section 1	691 R	1.300	"	Oct. 25, 1900	16,493.95	
Section 2	691 R	1,500	"	Oct. 25, 1900	13,890.25	
Section 3	691 R	1,600	"	Oct. 23, 1900	13,286.05	
Windsmere—						
Section 1	691 R	1,100	"	Dec. 21, 1900	15,974.11	
Section 2	691 R	1,100	"	Feb. 17, 1901	15,335.79	
Section 3	691 R	1,200	"	Jan. 25, 1901	15,510.31	
Section 4	691 R	1,200	"	Jan. 16, 1901	15,953.25	
Wicame—						
Section 1	691 R	1,900	"	Jan. 16, 1901	15,953.25	
Section 2	691 R	1,900	"	Oct. 12, 1900	15,721.64	
Section 3	691 R	1,000	"	Oct. 29, 1900	14,880.60	
Section 4	691 R	1,062	"	Dec. 1, 1900	15,515.04	
Clermont—						
Section 1	692 R	700	"	April 24, 1901	10,566.36	
Section 2	692 R	600	"	June 1, 1901	10,093.39	
Section 3	692 R	800	"	July 4, 1901	13.045.87	
Clermont Lower—						
Section 1	692 R	1,600	"	Oct. 30, 1900	15,813.72	
Section 2	692 R	1.600	"	Oct. 30, 1900	15,720.58	
Section 3	692 R	1,400	"	Dec. 15, 1900	15.614.48	
Section 4	692 R	1,500	"	Dec. 3, 1900	14.947.27	

STATEMENT No. 14—Continued.

NAME OF LEVEE	Miles below Cairo	Length of Line	New or Enlargement	Date of Completion	Cubic Yards	Total Cost
Fifth Louisiana Levee District—Cont.						
Panola—						
Section 1	693 R	1,300	Enlargmt.	Oct. 27, 1900	13,351.66	
Section 2	693 R	2,400	"	Nov. 19, 1900	16,225.95	
Section 3	693 R	1,900	"	Sept. 29, 1900	16,203.08	
Section 4	693 R	1,900	"	Dec. 3, 1900	15,875.54	
Helena—						
Section 1	693 R	1,800	"	Oct. 2, 1900	14,527.83	
Section 2	693 R	800	"	Nov. 19, 1900	14,755.49	
Section 3	693 R	1,200	"	Dec. 21, 1900	13,992.27	
Section 4	693 R	1,200	"	Dec. 21, 1900	13,997.79	
Concordia—						
Section 1	694 R	700	"	Dec. 3, 1900	13,659.41	
Section 2	694 R	700	"	Dec. 28, 1900	14,008.94	
Section 3	694 R	900	"	Jan. 24, 1901	16,941.49	
Section 4	694 R	800	"	Mar. 14, 1901	14,193.21	
Sycamore—						
Section 1	694 R	900	"	Oct. 31, 1901	14,757.04	
Section 2	694 R	700	"	April 24, 1901	15,058.02	
Section 3	694 R	800	"	Mar. 22, 1901	15,842.83	
Section 4	694 R	776	"	April 8, 1901	14,550.68	
Esperanza—						
Section 1	711 R	800	"	Oct. 9, 1900	14,599.98	
Section 2	711 R	1,000	"	Sept. 15, 1900	15,755.02	
Section 3	711 R	800	"	Sept. 3, 1900	14,810.06	
Section 4	711 R	800	"	Sept. 3, 1900	9,049.86	
Section 16	713 R	1,200	"	May 26, 1900	19,135.83	
Section 17	713 R	1,200	"	May 26, 1900	18,898.45	
Fish Pond—						
Section 1	723 R	2,370	"	Feb. 26, 1902	13,855.07	
Section 2	723 R	3,100	"	Dec. 23, 1901	14,188.02	
Section 3	723 R	2,500	"	Sept. 26, 1901	14,182.64	
Glasscock, Lot 1—						
Section 1	724 R	1,700	"	June 6, 1900	16,131.16	
Section 2	724 R	1,400	"	Nov. 29, 1900	14,791.38	
Glasscock, Lot 2—						
Section 1	725 R	1,300	"	Dec. 16, 1900	12,752.41	
Section 2	725 R	1.274	"	Dec. 16, 1900	13,528.84	
				Grand Total	.....	$134,070 66
Atchafalaya Basin Levee District						
Upper Grand Bay—						
Section 1	808 R	1,409	Enlargmt.	May 17, 1901	14,925.95	
Section 2	808 R	1,500	"	May 17, 1901	15,379.20	
Section 3	808 R	1,500	"	May 17, 1901	15,627.96	
Grand Bay—						
Section 1	808 R	600	"	Feb. 2, 1901	13,462.45	
Section 2	808 R	500	"	Jan. 3, 1901	11,977.39	
Section 3	808 R	500	"	Nov. 29, 1900	14,254.41	
Refuge—						
Section 1	809 R	1.084	"	Aug. 9, 1900	13,187.60	
Section 2	809 R	1,100	"	Sept. 8, 1900	12,468.62	
Section 3	809 R	1,100	"	Oct. 8, 1900	13,452.53	

STATEMENT No. 14—Continued.

NAME OF LEVEE	Miles below Cairo	Length of Line	New or Enlargement	Date of Completion	Cubic Yards	Total Cost
Atchafalaya Basin Levee District--Cont.						
Wildwood--						
Section 1	810 R	1,000	Enlargmt.	Dec. 6, 1900	14-364.11	
Section 2	810 R	900	"	Dec. 27, 1900	13,706.22	
Section 3	810 R	800	"	Dec. 12, 1900	13,406.74	
Point Manoir—						
Section 1	811 R	800	"	Jan. 10, 1901	12,728.03	
Section 2	811 R	900	"	Jan. 23, 1901	12,096.05	
Section 3	811 R	1,190	"	Jan. 31, 1901	12,003.89	
Yatton --						
Section 1	814 R	1,363	"	Feb. 22, 1901	12,715.42	
Section 2	814 R	1,000	"	Mar. 30, 1901	12,910.67	
Section 3	814 R	800	"	April 6, 1901	13,267.20	
Section 4	814 R	900	"	Mar. 30, 1901	13,604.08	
Woodlawn--						
Section 1	814 R	700	"	Mar. 2, 1901	9,737.13	
Section 2	814 R	800	"	April 6, 1901	10,840.68	
Section 3	814 R	800	"	Mar. 30, 1901	10,304.62	
Section 4	814 R	930	"	Mar. 4, 1901	11,039.71	
Smithfield--						
Section 1	822 R	1,212	"	Sept. 3, 1901	11,893.69	
Section 2	822 R	1,100	"	Aug. 25, 1900	11,379.16	
Section 3	822 R	1,000	"	Sept. 8, 1900	11,451.90	
Section 4	822 R	1,000	"	Sept. 8, 1900	12,083.78	
Orange Grove--						
Section 1	823 R	1,000	"	Aug. 11, 1900	11,298.33	
Section 2	823 R	1,000	"	Aug. 4, 1900	11,404.86	
Section 3	823 R	1,100	"	Sept. 3, 1900	11,798.47	
Section 4	823 R	980	"	Aug. 25, 1900	12,510.22	
Devall--						
Section 1	823 R	1,024	"	July 17, 1900	14,604.55	
Section 2	823 R	800	"	Sept, 2, 1900	13,758.83	
Barroza -						
Section 1	824 R	700	"	Sept. 11, 1900	15,042.06	
Section 2	824 R	700	"	Aug. 30, 1900	13,855.77	
Port Allen--						
Section 5	833 R	1,100	"	July 28, 1900	21,189.55	
Limerick--						
Section 1	834 R	900	"	July 11, 1900	13,401.85	
Section 2	834 R	1,100	"	July 10, 1900	14,082.70	
Section 3	834 R	1,000	"	May 12, 1900	12,381.26	
Section 4	834 R	1,000	"	June 15, 1900	12,451.49	
Section 5	834 R	600	"	April 20, 1900	12,833.26	
				Grand Total		$85,102.81
Lafourch Levee District						
St. James Church—						
Section 1	902 R	1,900	"	June 10, 1901	13,459.66	
Section 2	902 R	1,900	"	Aug. 20, 1901	13,568.80	
Section 3	902 R	1,700	"	April 26, 1901	13,730.36	
Section 4	902 R	1,660	"	July 30, 1901	13,882.25	
Bonsecour -						
Section 1	903 R	1,395	"	Oct. 9, 1900	11,831.18	
Section 2	903 R	1,300	"	Oct. 9, 1900	11,251.	
Section 3	903 R	1,400	"	Oct. 4, 1900	11,368.06	
Section 4	903 R	1,600	"	Oct. 9, 1900	11,699.94	
Section 5	903 R	1,500	"	Oct. 9, 1900	11,196.89	
					74	

STATEMENT No. 14—Continued.

NAME OF LEVEE	Miles below Cairo	Length of Line	New or Enlargement	Date of Completion	Cubic Yards	Total Cost
Lafouche Basin Levee District—Cont.						
Delogny—						
Section 1	906 R	1,165	Enlargmt.	Aug. 24, 1900	10,243.76	
Section 2	906 R	1,000	"	Aug. 24, 1900	10,653.39	
Section 3	906 R	1,000	"	Aug. 8, 1900	10,045.18	
Section 4	906 R	1,000	"	Aug. 8, 1900	10,380.47	
Section 5	906 R	700	"	July 20, 1900	9,546.45	
Oak Alley—						
Section 1	908 R	1,000	"	July 8, 1900	15,552.02	
Section 4	908 R	1,000	"	May 6, 1900	13,595.37	
Willow Grove—						
Section 2	917 R	1,628	"	Sept. 24, 1900	13,923.08	
Alliance—						
Section 1	921 R	3,034	"	Nov. 21, 1900	14,916.17	
Ashton—						
Section 1	941 R	969	"	May 8, 1900	9,662.95	
Ellington—						
Section 1	941 R	1,488	"	Feb. 6, 1901	11,405.75	
Section 2	941 R	1,534	"	June 14, 1900	11,460.60	
Alice—						
Section 1	946 R	2,808	"	Aug. 1, 1900	13,744.93	
Section 2	946 R	2,090	"	June 30, 1900	13,580.77	
Section 3	946 R	1.551	"	Aug. 1, 1900	13,527.68	
Soniat—						
Section 1	947 R	1,848	"	Dec. 12, 1900	11,498.63	
Section 2	947 R	1,800	"	Dec 31, 1900	12,116.07	
Section 3	947 R	1,800	"	Jan. 19, 1901	11,861.22	
Section 4	947 R	1,800	"	Mar. 7, 1901	12,848.31	
Odier—						
Section 1	949 R	1,900	"	April 21, 1901	13,206.63	
Section 2	949 R	1,900	"	May 13, 1901	13,182.92	
Section 3	949 R	1,600	"	Sept. 12, 1901	13,234.92	
Section 4	949 R	1,966	"	Sept. 3, 1901	12,960.83	
Willswood—						
Section 1	951 R	1,044	"	July 2, 1900	2,733.39	
Section 2	951 R	1,400	"	June 15, 1900	9,656.59	
Section 3	951 R	1,482	"	May 17, 1900	9,550.99	
Starlight—						
Section 1	953 R	1,125	"	Feb. 19, 1902	11,903.42	
Section 2	953 R	1,150	"	May 15, 1901	11,925.94	
Upper Magnolia—						
Section 3	980 R	2.420	"	Sept. 3, 1900	12,170.41	
Fort St. Leon						
Section 1	981 R	2,703	"	Oct. 27, 1900	14,075.48	
Section 2	981 R	3,100	"	Sept. 3, 1900	15,710.67	
Bellechasse—						
Section 1	983 R	1,694	"	Feb. 24, 1901	11,347.41	
Section 2	983 R	1,700	"	Feb. 24, 1901	11,026.98	
Section 3	984 R	2,100	"	April 3, 1901	11,337.40	
Section 4	984 R	2,512	"	April 3, 1901	11,054.40	
				Grand Total	.....	$66,925.63

STATEMENT No. 14—Continued.

NAME OF LEVEE	Miles below Cairo	Length of Line	New or Enlargement	Date of Completion	Cubic Yards	Total Cost
Buras Levee District						
Abadie	1022 R	1,235	New	Jan. 23, 1902	13,080.47	
Rodey Extension	1038 R	2,238	Enlargmt.	Jan 23, 1902	9,437.33	
Schaefer	1038 R	1,515	"	Dec. 24, 1900	9,196.05	
				Grand Total		$4,706 33
Pontchartrain Levee District						
Section 7	836 L	400	Enlargmt.	Dec. 22, 1900	4,379.62	
Burtville—						
Section 1	847 L	1,022	"	June 11, 1900	14,481.82	
Section 2	847 L	900	"	Jan. 4, 1901	13,149.48	
Section 3	847 L	800	"	Oct. 16, 1900	12,831.28	
Section 4	847 L	900	"	Mar. 15, 1901	14,144.48	
Section 5	847 L	900	"	Mar. 15, 1901	14,622.67	
Woodstock—						
Section 1	848 L	700	"	April 30, 1901	12,199.72	
Section 2	848 L	500	"	Mar. 30, 1901	10,737.94	
Section 3	848 L	600	"	Mar. 30, 1901	12,012.90	
Section 4	848 L	700	"	Feb. 27, 1901	11,180.54	
Section 5	848 L	700	"	Jan. 17, 1901	11,091.43	
Manchac—						
Section 1	848 L	800	"	Dec. 18, 1900	12,422.17	
Section 2	848 L	800	"	Nov. 28, 1900	12,258.18	
Section 3	848 L	800	"	Oct 29, 1900	11,930.48	
Section 4	848 L	900	"	Oct. 17, 1900	12,805.04	
Section 5	848 L	900	"	Nov. 15, 1900	13,283.36	
Granada—						
Section 1	849 L	800	"	Oct. 3, 1900	12,425.35	
Section 2	849 L	800	"	Sept. 24, 1900	12,172.28	
Section 3	849 L	900	"	Aug. 30, 1900	13,500.36	
Section 4	849 L	900	"	April 26, 1901	14,317.36	
Section 5	849 L	1,000	"	July 21, 1900	13,214.02	
Hermitage—						
Section 1	850 L	1,000	"	July 14, 1900	12,256.87	
Section 2	850 L	1,000	"	July 2, 1900	12,884.89	
Section 3	850 L	1,000	"	Sept. 17, 1900	13,466.30	
Section 4	850 L	900	"	Aug. 2, 1900	12,522.34	
Section 5	850 L	1,000	"	Aug. 17 1900	13,523.76	
Towles—						
Section 1	851 L	1,500	"	Aug. 17, 1900	16,634.99	
Section 2	851 L	1,200	"	Aug. 30, 1900	14,602.96	
Section 3	851 L	1,200	"	Sept. 27, 1900	14,938.00	
Forlorn Hope—						
Section 1	858 L	1,300	"	Sept. 28, 1900	15,266.59	
Section 2	858 L	1,200	"	July 11, 1900	14,751.52	
Section 3	858 L	1,200	"	June 5, 1900	15,387.92	
Joly—						
Section 1	865 L	679	"	Jan. 15, 1901	9,075.91	
Section 2	865 L	700	"	Dec. 15, 1900	8,877.40	
Section 3	865 L	700	"	Jan. 24, 1901	9,164.09	
Section 4	865 L	860	"	Dec. 8, 1900	9,989.46	
Point Clear—						
Section 1	868 L	748	"	June 5, 1900	8,842.39	
Section 2	868 L	822	"	June 5, 1900	8,213.98	
Point Clear Lower—						
Section 1	869 L	1,290	"	Feb. 21, 1901	14,724.85	
Section 2	869 L	1,400	"	Mar. 18, 1901	14,301.41	
Section 3	869 L	1,500	"	Feb. 21, 1901	14,906.56	
Section 4	869 L	1,200	"	Mar. 18, 1901	13,894.50	
Section 5	869 L	1,200	"	Mar. 23, 1901	14,524.57	
Section 6	869 L	1,544	"	Feb. 5, 1901	14,507.67	

STATEMENT No. 14—Continued.

NAME OF LEVEE	Miles below Cairo	Length of Line	New or Enlargement	Date of Completion	Cubic Yards	Total Cost
Pontchartrain Levee District—Cont.						
Leper Home—						
Section 2	870 L	1,264	Enlargmt.	June 15, 1900	13,851.62	
Section 3	870 L	1,300	"	June 15, 1900	13,197.76	
Section 4	870 L	1,200	"	June 15, 1900	13,955.08	
Indian Camp—						
Section 1	871 L	1,100	"	June 5, 1900	12,961.82	
Section 2	871 L	900	"	June 5, 1900	13,292.26	
Section 3	871 L	1,000	"	May 16, 1900	12,086.66	
Section 4	871 L	1,000	"	June 6, 1900	12,016.00	
Section 5	871 L	1,100	"	June 6, 1900	13,380.46	
Riverton—						
Section 1	890 L	1,100	"	Sept. 17, 1900	13,462.02	
Section 2	890 L	1,100	"	Oct. 12, 1900	13,001.41	
Section 3	890 L	1,000	"	Nov. 15, 1900	13,949.88	
Section 4	890 L	1,000	"	Feb. 18, 1901	12,605.93	
Section 5	890 L	800	"	Jan. 16, 1901	11,633.00	
Section 6	890 L	889	"	Dec. 14, 1900	12,973.51	
Burnside—						
Section 1	891 L	1,200	"	Sept. 17, 1900	12,725.65	
Section 2	891 L	1,000	"	Oct. 6, 1900	12,815.62	
Section 3	891 L	1,000	"	Oct. 26, 1900	12,195.84	
Section 4	891 L	1,000	"	Dec. 12, 1900	11,730.79	
Section 5	891 L	1,000	"	Dec. 12, 1900	11,548.10	
Monroe—						
Section 1	892 L	1,000	"	Jan. 24, 1901	12,687.50	
Section 2	892 L	800	"	Dec. 5, 1900	13,432.15	
Section 3	892 L	1,100	"	Feb. 18, 1901	12,903.17	
Section 4	892 L	800	"	Nov. 9, 1900	13,875.22	
Section 5	892 L	1,009	"	Jan. 12, 1901	12,411.38	
				Grand Total	.....	$101,803 49
Lake Borgne Basin Levee District						
Kenilworth—						
Section 2	979 L	1,300	Enlargmt.	Nov. 13, 1900	11,839.19	
Mon Plaisir—						
Section 1	984 L	2,000	"	Mar. 16, 1901	10,070.54	
Section 2	985 L	2,400	"	Dec. 22, 1900	9,617.46	
Section 3	985 L	2,720	"	Dec. 22, 1900	10,248.60	
Scarsdale—						
Section 1	986 L	3,444	"	Oct. 31, 1900	14,155.56	
Section 2	986 L	2,883	"	Oct. 31, 1900	14,114.00	
Mary—						
Section 1	987 L	3,200	"	Dec. 24, 1900	10,889.52	
Section 2	987 L	3,031	"	Dec. 24, 1900	11,059.28	
Fanny	983 L	3,804	"	Mar 12, 1901	13,159.11	
				Grand Total	.....	$14,028 62
Grand Prairie Levee District						
Edgecombe—						
Section 1	1024 L	1,541	New	Jan. 17, 1901	10,928.91	
Section 2	1024 L	1,480	"	Feb. 20, 1901	9,523.77	
				Grand Total	.....	32,761 12

APPENDIX A. STATEMENT

RECAPITULATION.

DISTRICT	MILES	
	New Levee	Enlargement
In Arkansas	2.81	16.96
In Louisiana		
Fifth Louisiana	5.02	20.85
Atchafalaya Basin	.....	7.48
Pontchartrain	.....	12.60
Lafourche Basin	.....	13.89
Lake Borgne	.....	4.69
Grand Prairie	0.57	.....
Buras	0.23	0.71
Totals	8.63	77.18

No. 15. UNITED STATES LEVEES.

Cubic Yards	Price—Cents	Cost	REMARKS
915,556	17.31	$ 98,558 25	
2,238,876	.....	339,722 37	
534,882	.....	85,102 81	
865,112	.....	101,803 49	
527,630	.....	66,925 63	
105,123	.....	14,028 62	
20,453	.....	2,761 12	
31,714	.....	4,706 33	
5,239,346		$713,608 62	

APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several Levee from April 20, 1900, to April 21, 1902, by the Districts, State

NAME OF DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Arkansas	Tensas Basin Levee District	0.50	14.29
	United States and Chicot Levee Dist.	2.81	16.96
	Totals	3.31	31.25
Louisiana— Fifth Louisiana Levee District	District	2.87	31.14
	State	3.98	1.18
	United States	5.02	3.61 17.24
	Totals	11.87	53.17
Atchafalaya Basin Levee District	District	6.62	34.57
	State	.....	8.42
	United States	.....	7.48
	Totals	6.62	50.47
Pontchartrain Levee District	District	.....	.....
	State	0.30	3.83
	United States	.....	12.60
	Totals	0.30	16.43
Lafourche Basin Levee District	District	4.30	5.61
	State	1.81	2.08
	United States	.....	13.89
	Totals	6.11	21.58
Orleans Levee District	District	0.10	0.83
	Total	0.10	0.83
Lake Borgne Levee District	State	0.71	1.94
	United States	.....	4.69
	Totals	0.71	6.63
Grand Prairie Levee District	District	0.50	0.18
	State	4.20	1.37
	United States	0.57	.....
	Totals	5.27	1.55
Buras Levee District	State	2.90	4.84
	United States	0.23	0.71
	Totals	3.13	5.55

No. 16. SUMMARY ACCORDING TO DISTRICTS.

Districts of Louisiana, and in Desha and Chicot Counties, Arkansas, and United States, as shown in the foregoing statements.

Cubic Yards	Average price per cubic yard—Cents	COST	STREAM	REMARKS
249,692	18.76	$ 104,335 15		
915,556	17.31	98,558 25		
1,165,248	.....	202,893 40		
994,925	14.61	145,377 18		
580,435	15.13	87,831 61		
1,257,043	.....	205,651 71	Upper Tensas	
981,823	.....	134,070 66	Lower Tensas	
3,814,233	.....	572,931 16		
2,110,483	16.89	354,939 19		
290,418	17.19	49,947 83		
534,882	.....	85,102 81		
2,935,783	.....	489,989 83		
6,263	12.60	2,318 32		
131,364	18.27	23,996 64		
865,112	.....	101,803 49		
1,002,739	.....	128,118 45		
585,354	17.69	103,604 11		
290,294	15.02	43,596 03		
527,630	.....	66,925 63		
1,403,278	.....	214,125 77		
* 23,618	18.16	4,290 57		
23,618	.....	4,290 57		
70,814	13.95	9,878 55		
105,123	.....	14,028 62		
175,937	.....	23,907 17		
7,286	13.49	983 60		
115,748	13.25	15,341 21		
20,453	.....	2,761 12		
143,487	.....	19,085 93		
97,159	16.85	16,373 14		
31,714	.....	4,706 33		
128,873	.....	21,079 47		

APPENDIX A. STATEMENT

NAME OF DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Caddo Levee District	District	2.08	0.13
	State	2.96	0.53
	Totals	5.04	0.66
Bossier Levee District	State	3.38	0.51
	Total	3.38	0.51
Red River, Atchafalaya and Bayou Bœuf Levee District	District	4.87	35.32
	State	.....	5.45
	Totals	4.87	40.77

RECAPITULATION

In Arkansas	3.31	31.25
In Louisiana—		
Fifth Louisiana Levee District	11.87	53.17
Atchafalaya Basin Levee District	6.62	50.47
Pontchartrain Levee District	0.30	16.43
Lafourche Basin Levee District	6.11	21.58
Orleans Levee District	0.10	0.83
Lake Borgne Basin Levee District	0.71	6.63
Grand Prairie Levee District	5.27	1.55
Buras Levee District	3.13	5.55
Caddo Levee District	5.04	0.66
Bossier Levee District	3.38	0.51
Red River, Atchafalaya and Bayou Bœuf Levee District	4.87	40.77
Totals	50.71	229.40
By Districts	21.84	122.07
By State	20.24	30.15
By United States	8.63	77.18
Totals	50.71	229.40

No. 16.—Cont. SUMMARY ACCORDING TO DISTRICTS.

Cubic Yards	Average price per cubic yard—Cents	COST	STREAM	REMARKS
161,188	18.27	$ 29,455 76		
220,498	14.41	31,795 27		
381,686	.....	61,251 03		
203,540	13.57	27,626 79		
203,540	.....	27,626 79		
1,264,149	11.05	139,695 83		
131,304	19.59	25,731 46		
1,395,453	.....	165,427 29		
1,165,248	.....	$ 202,893 40		
3,814,233	.....	572,931 16		
2,935,783	.....	489,989 83		
1,002,739	.....	128,118 45		
1,403,278	.....	214,125 77		
23,618	.....	4,290 57		
175,937	.....	23,907 17		
143,487	.....	19,085 93		
128,873	.....	21,079 47		
381,686	.....	61,251 03		
203,540	.....	27,626 79		
1,395,453	.....	165,427 29		
12,773,875	.....	$ 1,930,726 86		
5,392,958	15.27	$ 884,999 71		
2,131,571	15.58	332,118 53		
5,239,346	.....	713,608 62		
12,763,875	.....	$ 1,930,726 86		

APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several Levee
from April 20, 1900, to April 21, 1902, by the Districts, State

STREAM	LEVEE DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Arkansas River	Tensas Basin	District	0.50	.....
		United States	1.00	.....
		Totals	1.50	.....
Mississippi River in Arkansas	Tensas Basin	District	.....	14.29
		United States	1.81	16.96
		Totals	1.81	31.25
Mississippi River in Louisiana	Fifth Louisiana	District	2.87	31.14
		State	3.98	1.18
		United States	5.02	3.61
			.....	17.24
		Totals	11.87	53.17
	Atchafalaya Basin	District	1.92	9.74
		State	.....	8.42
		United States	.....	7.48
		Totals	1.92	25.64
	Pontchartrain	District	.....	.....
		State	0.30	3.83
		United States	.....	12.60
		Totals	0.30	16.43
	Lafourche Basin	District	2.08	1.72
		State	0.20	2.04
		United States	.....	13.89
		Totals	2.28	17.65
	Orleans	District	0.10	0.83
		Totals	0.10	0.83
	Lake Borgne Basin	State	0.71	1.94
		United States	.....	4.69
		Totals	0.71	6.63
	Grand Prairie	District	0.50	0.18
		State	4.20	1.37
		United States	0.57	.....
		Totals	5.27	1.55
	Buras	State	2.90	4.84
		United States	0.23	0.71
		Totals	3.13	5.55

No. 17. SUMMARY ACCORDING TO STREAMS.

Districts of Louisiana, and in Desha and Chicot Counties, Arkansas, and United States, as shown in the foregoing statements.

Cubic Yards	Expenditures	REMARKS
74,302	$4,987 79	
169,788	24,109 89	
244,090	$29,097 68	
175,390	$99,347 36	
745,768	74,448 36	
921,158	$173,795 72	
994,925	$145,377 18	
580,432	87,831 61	
1,257,053	205,651 71	U. S. Upper Tensas.
981,823	134,070 66	U. S. Lower Tensas.
3,814,233	$572,931 16	
741,614	$137,599 45	
290,418	49,947 83	
534,882	85,102 81	
1,566,914	$272,650 09	
6,263	$2,318 32	
131,364	23,996 64	
865,112	101,803 49	
1,002,739	$128,118 45	
271,567	$47,258 62	
101,562	13,634 83	
527,630	66,925 63	
900,759	$127,819 08	
23,618	$4,290 57	
23,618	$4,290 57	
70,814	$9,878 55	
105,123	14,028 62	
175,937	$23,907 17	
7,286	$983 60	
115,748	15,341 21	
20,453	2,761 12	
143,487	$19,085 93	
97,159	$16,373 14	
31,714	4,706 33	
128,873	$21,079 47	

APPENDIX A. STATEMENT No.

STREAM	LEVEE DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Red River	Caddo	District	2.08	0.13
		State	2.96	0.53
		Totals	5.04	0.66
	Bossier	State	3.38	0.51
		Totals	3.38	0.51
	R. R., A. & B. B	District		0.14
		State		0.45
		Totals		0.59
Bayou des Glaizes	R. R., A. & B. B	District	1.49	12.83
		State		3.03
		Totals	1.49	15.86
Atchafalaya River	R. R., A. & B. B	District	3.38	22.35
		State		1.97
	Atchafalaya Basin	District	4.70	23.79
		Totals	8.08	48.11
Bayou Lafourche	Atchafalaya Basin	District		1.04
	Lafourche Basin	District	2.22	3.89
		State	1.61	0.04
		Totals	3.83	4.97

RECAPITULATION

Arkansas River	1.50	
Mississippi River (in Arkansas)	1.81	31.25
Mississippi River (in Louisiana)	25.58	127.45
Red River	8.42	1.76
Bayou des Glaizes	1.49	15.86
Atchafalaya River	8.08	48.11
Bayou Lafourche	3.83	4.97
Totals	50.71	229.40

17—Cont. SUMMARY ACCORDING TO STREAMS.

Cubic Yards	Expenditures	REMARKS
161,188	$29,455 76	
220,498	31,795 27	
381,686	$61,251 03	
203,540	$27,626 79	
203,540	$27,626 79	
3,245	$1,622 50	
14,524	5,954 84	
17,769	$7,577 34	
356,064	$46,879 35	
63,000	10,395 00	
419,064	$57,274 35	
904,840	$91,193 98	
53,780	9,381 62	
1,310,898	210,236 70	
2,269,518	$310,812 30	
47,971	$7,103 04	
313,787	56,345 49	
188,732	29,961 20	
550,490	$93,409 73	
244,090	$ 29,097 68	
921,158	173,795 72	
7,756,560	1,169,881 92	
602,995	96,455 16	
419,064	57,274 35	
2,269,518	310,812 30	
550,490	93,409 73	
12,763,875	$1,930,726 86	

APPENDIX A. STATEMENT No.

STREAM	LEVEE DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Red River	Caddo	District	2.08	0.13
		State	2.96	0.53
		Totals	5.04	0.66
	Bossier	State	3.38	0.51
		Totals	3.38	0.51
	R. R., A. & B. B.	District	.....	0.14
		State	.....	0.45
		Totals	.....	0.59
Bayou des Glaizes	R. R., A. & B. B.	District	1.49	12.83
		State	.....	3.03
		Totals	1.40	15.86
Atchafalaya River	R. R., A. & B. B.	District	3.38	22.35
		State	.....	1.97
	Atchafalaya Basin	District	4.70	23.79
		Totals	8.08	48.11
Bayou Lafourche	Atchafalaya Basin	District	.....	1.04
	Lafourche Basin	District	2.22	3.89
		State	1.61	0.04
		Totals	3.83	4.97

RECAPITULATION

Arkansas River	1.50	.....
Mississippi River (in Arkansas)	1.81	31.25
Mississippi River (in Louisiana)	25.58	127.45
Red River	8.42	1.76
Bayou des Glaizes	1.49	15.86
Atchafalaya River	8.08	48.11
Bayou Lafourche	3.83	4.97
Totals	50.71	229.40

17—Cont. SUMMARY ACCORDING TO STREAMS.

Cubic Yards	Expenditures	REMARKS
161,188	$29,455 76	
220,498	31,795 27	
381,686	$61,251 03	
203,540	$27,626 79	
203,540	$27,626 79	
3,245	$1,622 50	
14,524	5,954 84	
17,769	$7,577 34	
356,064	$46,879 35	
63,000	10,395 00	
419,064	$57,274 35	
904,840	$91,193 98	
53,780	9,381 62	
1,310,898	210,236 70	
2,269,518	$310,812 30	
47,971	$7,103 04	
313,787	56,345 49	
188,732	29,961 20	
550,490	$93,409 73	
244,090	$ 29,097 68	
921,158	173,795 72	
7,756,560	1,169,881 92	
602,995	96,455 16	
419,064	57,274 35	
2,269,518	310,812 30	
550,490	93,409 73	
12,763,875	$1,930,726 86	

APPENDIX A. STATEMENT

GRAND

DISTRICT	MILES	
	New Levee	Enlargement
Districts	21.84	122.07
State	20.24	30.15
United States	8.63	77.18
Totals	50.71	229.40

No. 18. SUMMARY.

TOTAL

Cubic Yards	Cost	REMARKS
5,392,958	$884,999 71	
2,131,571	332,118 53	
5,239,346	713,608 62	
12,763,875	$1,930,726 86	

APPENDIX B.

Copies of Sundry Special Reports, Letters, etc., from the Board of State Engineers to the various Levee Boards and Commissioners, and to others.

APPENDIX B.

SUNDRY SPECIAL REPORTS TO LEVEE COMMISSIONERS.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 1st, 1900.

Hon. J. P. Parker, President Board of Commissioners, Tensas Basin Levee District, Monroe, La.:

DEAR SIR—At the request of Messrs. Collins and Graves of your Board, I take pleasure in reporting that the inspection of the levees in Arkansas, which we were delegated to make, was duly completed.

At Arkansas City we were joined by Mr. E. C. Tollinger, U. S. Asst. Engineer, and Mr. T. S. Shields, U. S. Inspector, and with them went over the line of levee from the angle above Opossum Fork, above Arkansas City, to Station 1200, or a point about five miles below Arkansas City. All but a short stretch of 900 feet of the repair work recently recommended by the Board of State Engineers to be done by your Board occurs within these limits, and it was agreed by your Committee that this work was essential to the betterment of the stretches of levee indicated, and should be promptly undertaken and executed.

No more favorable opportunity for doing this work than the present could possibly be imagined, owing to the fact that no indications of high water exist at this writing, and the time of the year is most seasonable for the rapid and vigorous growth of Bermuda sod.

Recognizing this, and that any loss of time in getting the repair work under way was to be deplored, the Committee decided to, at once, issue, in the shape of a circular, an advertisement for the work, and a form for contractors to submit bids, subject to the approval of your Board when it would meet, presumably, on Friday, 4th inst.

This advertisement covered the following stretches of work, prescribing that the slopes of the embankments should be restored with surface material and planted with living roots of Bermuda grass not more than one foot apart, viz:

Stations 35 to 44; 344 to 380; 380 to 400; 520 to 540; 677 to 710; 787 to 798; 798 to 887; all above Arkansas City, and stations 1080 to 1113, and 1113 to 1200, below Arkansas City.

It is required that the work be done to the satisfaction of the Board of State Engineers, and completed on or before the 31st day of May, 1900.

It was understood that similar repair work, would, at the same time, be done by the United States on the following stretches of levee, in which you are equally interested, viz:

Amos Bayou Line; Stations 80 to 268; Main Line, 197 to 219; 420 to 484; 540 to 605; 605 to 630; 630 to 645; all above Arkansas City; and 1490 to 1511; 1839 to 1854; 1943 to 1954; 2395 to 2450; 3078 to 3090; 3096 to 3139; 3152 to 3160; 3400 to 3435; 3435 to 3499, below Arkansas City.

It may not be amiss at this time to sound a note of warning in regard to conditions along the Lucca Loop stretch of levee. While no immediate breach is to be feared in the levee line, caving along this stretch of levee is steadily going on, and the bank is slowly, but surely approaching a proximity to the levee line, which must, within another season or so, at least, require the construction of a new levee of considerable length and large proportions.

In conclusion, I will quote for your immediate information some general remarks made in the biennial report of the Board of State Engineers, submitted to the Governor on the 20th inst., in regard to the work performed during the past two years affecting the district, and the general condition of the line of levee aiding in protecting the district from overflow, viz:

"*Tensas Basin Levee District.* All of the levee work undertaken by this district, during the past two years, has been put upon the line of public levees in Arkansas aiding in protecting the district from overflow.

"This work has been as follows, viz: 0.67 miles of new levee and 5.78 miles of enlargement, amounting to 327,832 cubic yards of earthwork, costing $58,726.33.

"A considerable sum was also expended by the district in high water expenses, weed cutting, etc., the exact amount of which we have been unable to ascertain.

"During this period the United States also built and enlarged about 65.43 miles of levee in the State of Arkansas to aid in the protection of the Tensas Basin Levee District, amounting to 1,673,427 cubic yards and costing $250,773.89, and, in conjunction with the Tensas Basin Levee District and the United States, the Arkansas Levee Boards, 1.83 miles of levee work, amouting to 132,762 cubic yards, costing $22,029.45.

"All of the work thus undertaken has been completed, and the line of public levee in Arkansas in which the Tensas Basin Levee District has a direct interest, may at this time be said to be, generally in a far better condition than at any time in the past, and, except for such defects as can only be discovered by actual test, should be equal to any flood that has, so far, ever passed Arkansas City.

"This should not, however, be accepted as indicative of such an improved condition as to warrant those charged with the conduct of the affairs of the district to relax their efforts towards further improvement.

"Improved grades and larger sections will become necessary, from time to time, and caving banks at one point and then another, must be expected, sooner or later to affect the integrity of the levee line in many localities, all which will require from those in interest strenuous efforts and large means to provide for the work involved."

Respectfully submitted,

F. M. KERR,
Asst. State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 20th, 1900.

MR. E. M. HICKS,
Wisner, La.

DEAR SIR:—Yours of the 16th, relative to meeting of Tensas Levee Board, was duly received.

If you will kindly have me notified of the date of your meeting we shall be pleased to have some of our Board present, and I hope I may be there myself.

I have a letter from Capt. Buck, Secretary Red Fork Levee Board, in which he says his Board has applied or will apply to the Tensas Basin Board and others for assistant in buiding levee required just above Red Fork; and asking me to visit the locality.

I shall be glad to do so, but probably cannot before your meeting.

I am not informed as to the present condition of the suit that was pending for the removal of the Amos Bayou Levee, built by your Board some years ago, but it seems to me that the Red Fork people should not expect assistance from you until they have quieted you in your rights as to the levee, nor in fact, until they can give you a right of way to extend the line further up Amos Bayou Ridge.

At any rate, I think all these matters should be considered before your Board commits itself to any proposition for subscribing funds for work above Red Fork.

We also have a letter from Capt. Tollinger, calling attention to certain work needed on the levee in which the Tensas Basin may be particularly interested, viz: from Station 43 to 338, (that is, from above Boggy Bayou to near Opossum Fork) which he estimates to require 120,000 cubic yards of enlargement; and Station 1019 to 1240 (Fulton Lake) for which he considers a "banquette" important, estimated to require 70,000 cubic yards. He estimates the probable cost of both pieces at say $31,100. I should be pleased to have your Board consider this matter at its next meeting.

Yours very truly,

HENRY B. RICHARDSON,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 6th, 1901.

To the Honorable Board of Levee Commissioners, for the Tensas Basin Levee District, Hon. E. M. Hicks, President, Monroe, La.:

GENTLEMEN:—You are already aware that the continued caving of the river bank at and below Lucca Landing, Desha Co., Ark., makes it evident that a new piece of levee must be

built there at an early date to cover the breach threatened in the levee line as now existing. While there is no immediate danger apparent there, and it seems probable that the levee as it now stands will remain intact for some time to come, it can hardly be expected that the present levee will last through the Spring of 1902; and it, therefore, appears necessary to provide at once for a new loop.

The failure of Congress to pass a Rivers and Harbors bill at its last session, has left the Mississippi River Commission without means to undertake any considerable levee work this season; otherwise the new levee required at Lucca would undoubtedly have been built by the United States. But as the matter now stands, there appears to be no other way open for providing the requisite means, except through the action of the Tensas Basin Levee Board. The local levee boards of Arkansas are, of course, as much interested in this work as you—or even more so; but, as you are aware, their resources are insignificant as compared with the usual requirements of the situation, and there is no doubt that other demands for any funds they can raise will develop during the season.

Several surveys have been made for a new Lucca Loop, which the United States Engineers have estimated to require from, say, 413,000 to 493,000 cubic yards of earthwork, and to cost from, say, $78,500 to $94,000. Any of the lines suggested by the U. S. Engineer's Office, appear to be well located; those most remote from the river bank (which are also probably the most costly) being, of course, preferable on account of the longer time they will probably last. Any of the lines would be mostly through the woods, and all would require embankments ranging from about 16 to 20 feet in height; and to secure favorable prices the work should be put under contract at the earliest date practicable, so as to allow all the time needed for construction, and also to take advantage of the fact that many contractors are about finishing the levee work they have undertaken, and are, presumably, now looking around for more.

From recent conversation and correspondence with your President on this subject, I presume it is certain that you will, at your meeting, on April 10th, take this matter up and

arrange to have money available for this, or other work that may become necessary, either by increase of taxation, or by borrowing,—which I am assured you can do at reasonable rates of interest. In my judgment it would be wise for you to have funds available to the extent of, say, $100,000 to meet emergencies that may arise within the ensuing year.

The work of building a new loop at Lucca, if it costs as much as the largest estimate given, or even more, as it possibly may, would hardly be completed in time to have the final payments become due within the current year; but it is important that arrangements be made at once to have funds forthcoming when earned, and to have the work put under contract and begun as soon as practicable.

It has been suggested that it might be possible for the United States Engineers to put the work under contract, limiting the liability of the United States to a nominal sum, while the bulk of the payments to be made for the work as it progressed, might be made by the Tensas Basin Levee District on certificates of the U. S. Engineer's Office, approved by the State Engineer.

In many respects such an arrangement would be desirable; and it might facilitate arrangements for an early beginning of the work if, at your approaching meeting, authority were given to your President, or a Committee of the Board, either to advertise for proposals and enter into contract for the construction of the Lucca Loop Levee; or else to enter into an agreement with any party to whom the United States may award the work, to make payments therefor as they become due, and upon certificates of the United States Engineer Officer in charge of the Third District Improving Mississippi River, as in the judgment of the President (or the Committee) may be most advantageous to the district. A resolution to that effect could do no harm, even if it accomplished nothing in the way of putting the work under United States jurisdiction.

Very respectfully,

HENRY B. RICHARDSON,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., February 27th, 1901.

Hon. J. T. McClellan, President Board of Commissioners Fifth Louisiana Levee District, Tallulah, Madi on Parish, La.:

DEAR SIR—Yours of the 25th was duly received yesterday morning. Shortly after I happened to meet Mr. Murphy, and had a short conversation with him relative to the matters referred to in your letter. I told him about the opinion of the Attorney General as to the power conferred upon the Federal Government, under the direction of the Mississippi River Commission, by Article 215 (now Article 240 of the Constitution), and that in accordance with this opinion we had not been called upon, nor had we considered it in any way necessary for the Board of State Engineers to take formal action in approval of levee locations made by the United States Engineers.

I think you have a copy of the Attorney General's opinion above referred to, but enclose another one with this; from the marked paragraph of which you will note that "any "action * * * in order to sanction, legalize, or validate "the action of the United States Engineers with reference" to the location of a levee built by the United States is not thought to be necessary.

In reply to your inquiry as to our "construction of the "right of using dirt for levees and banquettes," referred to in Col. Potter's letter to you of February 19th instant (which I return herewith), I can only say that it has always seemed to us that the right of the public to enter upon and appropriate private property for the making and repair of levees, without compensation to the owners (which is fully recognized by the jurisprudence of the State, and has been confirmed by the U. S. Supreme Court in Eldridge vs. Trezevant) carried with it the right to take the earth required therefor from either side of the levee, and from any place where in the public interest it could be best obtained. I am not aware, however, that this particular point has ever been passed upon by the Courts. But if it is still an open ques-

tion, I am inclined to think that the sooner it is settled the better it will be for all concerned.

And, hence, I hope your Board will promptly assume as you have in similar cases in the past, any responsibility for damage that may arise on account of taking earth from the land side of the Willow Point Loop, as requested by Col. Potter.

The Board of State Engineers has no doubt of the desirability of building the banquettes contemplated at Willow Point Loop Levee by Col. Potter, and is of the opinion that earth for their construction should now be taken from the land side of the levee line.

Thompson is not yet quite equal to a trip up the levee line as proposed by you; but if you wish it, I shall be pleased to accompany you from Tallulah any day after March 3d (Sunday) of next week, to Willow Point Loop or elsewhere if you will fix the date and give me notice of (say) two days.

Yours very truly,

HENRY B. RICHARDSON,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., OCT. 8. 1901.

Hon. J. T. McClellan, President, and Members Board of Commissioners, Fifth Louisiana Levee District, Tallulah, Madison Parish, La.

GENTLEMEN—Having made several inspections over your entire district, since your last meeting, accompanied for the most part by your President, Mr. McClellan, and having been designated to look particularly after the Fifth District by the Board of State Engineers, I have the honor to submit the following report, covering the following subjects, viz: First, statement of yardage and cost per cubic yard of work undertaken by your district from December 1, 1900, to October 1, 1901; second, statement of work advertised to be let at the office of the Board of State Engineers on Tuesday, October 22, 1901; third, statement of number of miles and cubic yards yet to be enlarged in the district to bring the entire levee system up to the 3-foot grade above '97 water; fourth, state-

ment of points where new levees will be necessary and estimate of yardage for same; fifth, caving banks and their condition along the front of the Fifth District; and sixth, drainage.

1st. Statement of Yardage and Cost per cubic yard of work undertaken in the Fifth Louisiana Levee District from December 1, 1900, to October 1, 1901.

NAME OF CONTRACT	TOTAL IN CONTRACT					Amount done since Dec. 1st 1901	Amount to be done Cubic Yards.
	Linear Feet		Cubic Yards	Price	Cost		
	New	Enlgt.					
BY THE DISTRICT.							
Phil. McGuire, Ext	.....	8,105	98,327	16 7-10	$16,420 60	98,327	.....
Phil. McGuire	.....	6,191	20,680	16 7-10	3,453 60	8,680	.....
Haggaman	.....	1,575	3,409	16 7-10	569 30	3.409	.....
Cohn	.....	1,870	12,396	16 7-10	2,070 13	396	.....
Homestead	.....	10,480	59,950	14	8,337 00	47,050	.....
Transylvania	.....	2,445	12,805	17	2,176 85	12,805	.....
Atherton	.....	8,775	38,545	11.74	4,525 18	38,545	.....
Stamboul	.....	6,990	34,066	16	5,450 56	34,066	.....
Pecan Grove to Henderson	.....	9,343	59,000	12.97	7,652 30	.....	59,000
Hugh McGuire	.....	2,984	19,153	16 7-10	3,198 85	653	.....
Duckport	5,516	.....	110,000	10	11,000 00	33,500	76,500
O'Brien to Martin	.....	7,252	29,689	23 1-2	6,976 91	17,689	.....
Harper to Stockbridge	.....	16,577	90,000	30	27,000 00	.....	90,000
Duckpond	.....	10,950	38,143	13	4,958 59	16,943	.....
Carter's to Vidalia	.....	14,787	75,000	12	9,000 00	.....	75,000
Vidalia	1,033	2,483	46,779	13&35	11,742 31	46,779	.....
Vidalia Exten	.....	1,362	16,683	13	2,168 79	16,683	.....
Vidalia to Moro	1,760	47 742	170,000	11	18,700 00	.....	170,000
Upper Green	4,220	9,393	105,000	15.40	16,170 00	.....	105,000
			1,039,125		$161,570 93		
					Average Price 15.54 cents.		
BY THE STATE.							
Donna Vista	.....	6 300	42,000	12.48	$ 5,241 60	.....	42,000
Cabin Teele	7,207	.....	207,598	13.22	27,464 81	150,637	.....
Cabin Teele	3,950	.....	42,000	11.97	5,027 40	.....	42,000
Martin Loop	1,426	.....	48,000	23.74	11,395 20	.....	48,000
Green	2,588	.....	50,311	13.43	6,756 76	50,311	.....
			389,906		$55,885 77		
					Average Price 14.33 cents.		

2nd. Statement of work advertised to be let at the office of the Board of State Engineers, on Tuesday, October 22, 1901.

NAME OF LEVEE.	PARISH.	APPROX'TE YARDAGE.
Alsatia	E. Carroll	110,000.
Claggett	Tensas	55,000.

3rd. Statement of number of miles and cubic yards yet to be enlarged in the district to bring the entire levee system to the 3-foot grade above '97 water.

NAME OF LEVEES.	LENGTH IN FEET	CUBIC YARDS.	
Ashton	192,000	70,000	
Newcomb	64,000	25,000	
Bunches Bend	49,900	160,000	
Cabin Teele	2,200	25,000	
Gibson	138,000	90,000	
Clermont	900	6.000	
Sycamore to Carter's Lane	31,900	280,000	New and enlargement.
		404,000	

Total in miles 23.82 — Upper Tensas District, 14.71 miles. Lower Tensas District, 9.11 miles.

4th. Statements of points where new levees will be necessary and estimate of yardage for same.

NAMES	CUBIC YARDS	
Killarney	140,000	
Point Pleasant	80,000	
Hard Times	160,000	
Kempe	130,000	(temporary line).
Moro	72,000	
Green	60,000	
Upper Glasscock	200,000	
Lower Glasscock	200,000	
Bougere	1,800,000	
	2,842,000	

NOTE:—Back or permanent line at Kempe would take some 1,500,000 cubic yards.

5th. Caving Banks and their condition along the front of the Fifth District. Under the head of caving banks we have to say that no extraordinary condition has existed during the several previous years on the front of the Fifth District. A period of three years of comparatively low water has had the effect of generally lengthening all of the caving bends at their upper and lower ends, and especially at their

upper ends where the extreme low water generally causes the current to impinge.

To take up the subject by detail, I would state that wherever there has been or is a marked approach of the caving bank to the levee line, that these points are watched by us with much more interest than where the distance to the levee line is remote.

I would respectfully call your attentiou to the *Elton Bend*, which has been revetted by the Government, so far arresting any further encroachment of the river towards the levee. The upper end of this revetment showed some signs of weakening, but none of it has given away. The Government is about to undertake the repair of this revetment in its weak places, and will no doubt bring it up ito its former standard.

The Bend from Point Lookout to Wilton Landing is encroaching upon the Louisiana side, and as the material of the bank is sharp sand, the changes have been very rapid. The distance now to a steep sand bank is 1,600 feet, and while I have not submitted an estimate for a new levee there, one will be required within the next few yeas.

The river between *Illawara and Salem* has changed considerably, and the channel is now following the Mississippi side, and the middle ground or sand bar is visible at low water, between the present channel and the Louisiana shore.

The bank from *Omega to Cabin Teele* is gradually approaching the levee, and at Rose Hill Landing, the distance is not more than 700 feet from the levee to the river, but the rate of caving has not been sufficiently rapid to cause any anxiety that a new levee will have to be constructed there within the next two or three years.

There has been a marked change along from *Sparta to Duckport*, and probably more caving in this bend than any other bend in the district. This has necessitated the letting of a new levee for 100,000 cubic yards, which is now under construction and which covers the threatened points there. This rapid change of channel has caused the current to strike against the bank at *Killarney* with much more force than formerly, and several slides are observable in the vicinity of Mr. Maxwell's store, and opposite the salient angle there the

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distance is now only 134 feet from this angle to the river bank. There is no change just in front of Mr. Maxwell's residence, nor has there been any there for quite a long time. It is possible that a levee will have to be undertaken there before next year, or, at furthest, by the early part of next season. But as this is a very high point, any loop or run-around could be taken care of there, even on a rising river, as the water does not flow over the bank until there is 45 feet on the Vicksburg gauge.

The bend around *Reid Levee* continues to cave, and is approaching so close to the upper end of *Biggs Levee* that we have let a loop covering this point and aggregating about 50,000 cubic yards, which is now under construction and which is distinctively a temporary location.

The caving at the foot of *Diamond Island tow head* has moved considerably down the river, which relieves the upper end of Diamond Island levee of any possibility of having to be renewed for many years.

Caving has been very active from *Lake Palmyra* to the lower end of *Buck Ridge*, and the life of *Point Pleasant Levee* will not be more than two or three years. But as the present levee line is in the form of a loop, a location at a very reasonable cost can be made permanent, or at least for twenty years.

Caving from *Ships Bayou to Hardtimes* has approached to within 1,200 feet of the lower end of *Hard Times Wilson Levee*, and is very active at this point, and will in a few years threaten the Hard Times Dike. It would be well for your Board to use its endeavors to have the United States Government undertake some revetment before the caving approaches too close to this dike.

There was very little active caving going on in *Hardscrabble Bend*, but the caving in Bondurant Bend at *Claggett* continues. We have, therefore, thought proper to let a new loop of about 50,000 cubic yards to cover this point, until the Government can extend the revetment further down stream, which I understand they intend to do.

The conditions along *Kempe Bend* have not materially changed, except that so far the Government revetment has shown no signs of weakening, and stands apparently in very

good condition. There has been practically no change above the revetment, but some caving has occurred below the lower end of it, and the bank is now caving some distance below Goldman Landing. Altogether, the conditions at Kempe are far better than was to be hoped, and unless some new developments take place, we can safely say that the present line will stand for one year or longer. Your district has let the enlargement of this levee, which is but little more than topping to place it approximately to a 3 foot grade, as there is a long stretch of the present line that is practically at the high water mark of 1897. If it should be necessary to build a short loop for the next season, there is no one else to do it but your district.

The revetment at *Giles Bend* is holding remarkably well, and when I saw it last was in excellent condition, especially the part which is above the low water mark. Your district has undertaken a long line of enlargement from Carter's Lane to Moro, a distance of about 14 miles; and also, under the name of Upper Green, has undertaken to enlarge the Deer Park Levee and build a piece of new levee at Fairview. We also included in the enlargement of levees from Vidalia to Moro, a short piece of levee at Arnauldia, which will cover the close points there. There is no doubt but that a new levee will be required at Green next season. We had at first concluded to advertise this levee, but having found the line so much closer at Fairview, we have concluded to do that piece of work instead.

While all of the points that I have mentioned require constant watchfulness on the part of the Board of State Engineers and of your Board, the rate of caving at any one of these points has been much less than on previous occasions, under conditions of extreme high water.

(6th.) Drainage. Frequent enlargement of the levees of your district in the past, and more especially those that are remote from the river, and are on a more or less permanent location, has caused the deepening of the pits in front of them, and the tendency of these to fill up, being situated as they mostly are, behind timber, is very slow.

This causes a great deal of the work in your district to

look much worse to the contractor than it really is, and thus often makes the cost considerable more per cubic yard, or more than if a suitable drainage were provided. Of course, you understand that in many cases where work is let late in the season, it is impossible to dry the pits sufficiently before it is let. But wherever work has been enlarged once or twice, it would pay the district to have the necessary drainage cut before the work is advertised, so that when it is examined by contractors dry pits will be seen rather than lakes of water.

I would therefore recommend to your district that wherever it is possible, within a reasonable cost, that the district undertake the drainage of all pits prior to advertising the work, and I believe that such a proceeding would be greatly to your financial advantage.

The numerous crevasses in the vicinity of Reid levee, and the construction of the Diamond Island levee across the natural drain, has caused a very large volume of water to remain behind Reid and Biggs' levees, thus making it a matter of impossibility to get any dirt there in case of emergency. I have a party of surveyors in the field now connecting the lowest places in Reid levee with Harper's Bayou. and making a survey sufficient for basing a very close estimate of the cost of doing this work. On a survey made previous to the high water of 1897, it was estimated that 45,000 cubic yards would construct a ditch with an 8 foot bottom, and 1½ to 1 side slopes from Reid levee to Harper's Bayou. But just how much deposit has taken place since this survey has been made by reason of Reid and Biggs' crevasses, it will be impossible to know until a report of this survey is made to me. I hope that your Board will undertake the drainage of this swamp before it is necessary to do any more levee work there.

The United States engineers are making vigorous efforts to induce the removal of fences from the levees, thus opening them to pasturage. They ask that their efforts in this direction be seconded by your Board. To appreciate the value of the grazing of stock on the levees, one has only to visit the levees that are enclosed in fields and those that are turned out to pasture to see the necessity of prohibiting fences

across levees for fields. Many abuses such as stock and foot paths exist in your line, especially in Concordia Parish, which should not be permitted, but which it is hard to prevent. The inspectors of the parishes should be instructed to fill all such places and sod them before the next season.

In conclusion, the general condition of the entire levee line throughout your district is better than it has ever been previously, and the sod is growing throughout the entire line, even on the works recently completed. The weeds have been cut over the worst stretches throughout the entire district, and while it is to be hoped that it will be a long time before we have to make a high water fight, I believe we are in better shape, generally, than ever before.

Yours respectfully,

FOR THE BOARD OF STATE ENGINEERS,

M. P. ROBERTSON,
Assistant State Engineer.

OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 18, 1902.

Estimate of cubic yards necessary to place entire levee line of the Fifth Louisiana Levee District from the Arkansas line to mouth of Red River to the Approved Grade, Miss. River Commission, with 8 feet crown slopes 3 to 1; also of new levees required within the next four years, based on same grade and section.

UPPER TENSAS.

LOCALITY NAME OF LEVEES	Station to Station	No. of Stations	Cubic Yards of Enlargement	Cubic Yards of New Levee	Total Cubic Yards
Ashton to Newcomb	0 to 200	200	250,000	.....	250,000
Bunche's Bend	200 " 750	550	750,000	.....	750,000
O'possum Point	750 " 850	100	125,000	.....	125,000
Wilson	850 " 930	80	90,000	.....	90,000
Cottonwood	930 " 1126	196	230,000	.....	230,000
Donna Vista	1126 " 1190	64	100,000	.....	100,000
Longwood	1190 " 1300	110	150,000	.....	150,000
Elton	1300 " 1460	160	210,000	.....	210,000
Lake Providence	1460 " 1550	90	Up to Miss. Riv. Com. Grade		
Lake Providence to Wyly	1550 " 1730	180	260,000	.....	260,000
Wyly to Point Lookout	1730 " 1840	110	170,000	.....	170,000
Homestead - Concord	1840 " 1990	150	210,000	.....	210,000
Lower Homestead to Transylvania	1990 " 2062	72	90,000	.....	90,000
Transylvania	2062 " 2264	206	.....	500,000	500,000
Wilton to Willow Point	2264 " 2480	216	400,000	.....	400,000
Willow Point	2480 " 2715	235	525,000	.....	525,000
Henderson	2715 " 2850	135	120,000	.....	120,000
Villa Vista	2850 " 2996	136	200,000	.....	200,000
Mascot	2996 " 3090	108	.....	400,000	400,000
Buckhorn	3090 " 3232	142	210,000	.....	210,000
Rosehill--Milikens Bend	3232 " 3535	330	190,000	350,000	540,000
Cabin Teele	3535 " 3680	145	150,000	.....	150,000
Duckport	3680 " 3763	83	95,000	.....	95,000
Young's Point to Delta	3793 " 4270	507	700,000	.....	700,000
Delta to Martin's	4270 " 4400	130	150,000	.....	150,000
Biggs to Bedford	4400 " 4667	270	.....	1,500,000	1,500,000
Totals	.....	....	5,375,000	2,750,000	8,125,000

LOWER TENSAS.

LOCALITY. NAME OF LEVEES	Station to Station	No. of Stations	Cubic Yards of Enlargement	Cubic Yards of New Levee	Total Cubic Yards
Christmas	63 to 259	196	175,000	.....	175,000
Diamond Island	259 " 432	173	249,000	.....	249,000
Bayou Rroundaway	432 " 540	108	100,000	.....	100,000
Bayou Vidal	540 " 618	78	78,000	.....	78,000
Ion and Woodburn	618 " 806	188	215,600	.....	215,600
Somerset	806 " 962	156	171,000	.....	171,000
Perkins	962 " 1138	176	246,400	.....	246,400
Bland	1138 " 1198	60	60,000	.....	60,000
Burn	1198 " 1204	6	7,200	.....	7,200
Point Pleasant	1204 " 1434	45	.....	112,500	112,500
Buck Ridge	1434 " 1462	28	25,000	.....	25,000
Elk Ridge	1462 " 1670	208	353,000	.....	353,000
White Oak Lake	1670 " 1771	101	151,000	.....	151,000
New Hard Times	1771 " 1980	120	.....	480,000	480,000
Evergreen—Boundurant	1980 " 2130	50	60,000	.....	60,000
Evergreen	2130 " 2196	66	Up to Mis	s. Riv. Co	m. Grade.
Evergreen	2196 " 2297	164	213,200	.....	213,200
Claggett	2297 " 2362	65	90,000	.....	90,000
Beaumont	2362 " 2392	30	24,000	.....	24,000
Bruin Bayou	2392 " 2405	13	16,000	.....	16,000
Panola	2405 " 2505	100	85,000	.....	85,000
St. Joseph and Duck Pond	2505 " 2617	112	120,000	.....	120,000
Cottage Home	2617 " 2771	154	220,000	.....	220,000
Harper's Bayou	2771 " 2924	153	190,000	.....	190,000
Kempe	2924 " 3241	352	.....	2,220.000	2,200,000
Goldman	3241 " 3315	74	80,000	.....	80,000
Waterproof	3315 " 3416	101	152,000	.....	152,000
L'Argent	3416 " 3526	84	Up to Mis	s. Riv. Co	m. Grade.
Aquasco	3526 " 3581	55	66,000	.....	66,000
Bayou L'Argent	3581 " 3694	113	Up to Mis	s. Riv. Co	m. Grade.
Cane Brake	3694 " 3800	106	" " "	" "	" "
Gibson	3800 " 3980	180	198,000	.....	198,000
Rifle Point	3980 " 4108	128	85,000	.....	85,000
Lake Concordia	4108 " 4664	556	612,000	.....	612,000
Sycamore	4664 " 4849	195	.....	600,000	600,000
Minorca to Palo Alto	4849 " 5046	197	180,000	.....	180,000
Palo Alto	5046 " 5132	86	74,000	.....	74,000
Vidalia to Whitehall	5132 " 5340	208	230,000	.....	230,000
Whitehall	5340 " 5380	47	.....	150,000	150,000
Whitehall to Moro	5380 " 5665	285	320,000	.....	320,000
Moro	5665 " 5719	55	.....	93,000	93,000
Morville	5719 " 5840	121	150,000	.....	150,000
Esperanza	5840 " 6035	195	Up to Mis	s. River C	om. Grade
Upper Green	6035 " 6067	33	.....	90,000	90,000
Green	6067 " 6090	23	26,000	.....	26,000
Lower Green	6090 " 6111	25	.....	70,000	70,000
Forrest Home to Fish Pond	6111 " 6267	156	172,000	.....	172,000
Ashley	6267 " 6383	133	160,000	.....	160,000
Glasscock	6383 " 6460	80	.....	210,000	210,000

LOWER TENSAS—CONTINUED.

LOCALITY NAME OF LEVEES	Station to Station	No. of Stations	Cubic Yards of Enlargement	Cubic Yards of New Levee	Total Cubic Yards
Glasscock	6460 to 6623	163	230,000	.....	230,000
Roseland to Wildwood...	6623 " 6808	185	150,000	.....	150,000
Bougere	.....	....	.....	2,000,000	2,000,000
			5,734,400	6,005,500	11,739,900
Recapitulation.					
Upper Tensas.....			5,375,000	2,750,000	8,125,000
Lower Tensas.....			5,734,400	6,005,500	11,739,900
Totals.....			11,109,400	8,755,500	19,864,900

Prepared at the request of J. T. McLellan, President of the Board of Commissioners of the Fifth Louisiana Levee District, by the Board of State Engineers, on January 20, 1902.

per M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 24th, 1900.

Col. T. G. Sparks, President A. B. L. D., Port Allen, La.

DEAR SIR—I returned yesterday from a trip over our Atchafalaya line, which I inspected thoroughly from one end to the other. I prevailed upon Mr. Dugas to accompany me so that he might see our Latanache dyke, and also our Atchafalaya levees. We reached Red River Landing in the evening, and spent several hours with Mr. Torras, discussing levees.

I found Bayou Latanache dyke still sloughing. The conditions there are as follows: The dyke was built in 18 feet of water. The material which was dumped in the water became necessarily saturated before it reached the bottom. As the base was built up and reached towards the water surface, it was therefore constructed of thoroughly wet material. Then the dyke kept building higher, above the surface of the water, and a point was reached when this superstructure became so heavy, that the underlying wet material was crushed out by the top weight, causing the slopes to slowly ooze and creep out, until they are now in some places, as flat as 12 to 1. This wheeling in of the superstructure has continued, and a corresponding crushing out of the lower material has accompanied it, as weight was added to the top. The occurrence at the Sardine Lake of our Point Manoir levee offers a similar condition to this.

Under the circumstances, and after having consulted with Mr. Dugas, I determined to stop work on the dyke, and give the base a chance to become solid and compact before adding any more weight to the top. The forces at that point remaining on the ground, but doing work in enlarging the adjoining levees. When the summer comes, we can drain the front portion of the dyke, and thereby give it additional opportunity to dry and solidify before adding any more weight to it. This dyke will be, when completed, an abnormally strong dyke, on account of its great section and flat slopes.

I looked carefully over the enlargement work which we are going to do on the Atchafalaya River. There are about

twenty-eight miles of this. Three convict camps and about 100 teams ought to do it before the next high water, and I have made arrangements with Messrs. Dameron & White to put this force on the work as they pull their forces off our work on the Mississippi River. One convict force is already at work on it. * * * * * * * * With regards, I am,

Very truly yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 20th, 1900.

Col. T. G. Sparks, President A. B. L. D., Musson P. O., La.:

DEAR SIR—I returned a few days ago from a thorough inspection of the levees of our district, and beg to report as follows:

The cave at Medora is not dangerous, and, to my mind, does not threaten the integrity of the levee lines for the present. I think that at that point our levee is good for this year, anyway, if not for more time.

The settling at Palo Alto which developed last year is still in the same condition, and although the cracks in the bank are right near the levee, yet I could see no indication of it being worse than it was last year.

A cave at Bayou Goula has occurred at the upper end of the cave of last year. This new cave is opposite the junction with the new levee which we built last year, and although at present it is far enough from the levee to cause no anxiety, yet it might possibly develop into a more serious cave which would jeopardize our levee line at that point. To my mind, this is the most serious cave in the district, although for the present it does not occasion the construction of a new levee.

A cave has occurred at White Castle, opposite the Lumber Mill's narrow gauge road. This cave is of small dimensions and does not at all threaten the levee, although it is in a bend of the river where the levees are rather near to the bank and where any serions cave would cause the construction of a new piece of levee. It indicates that we may expect

to have to construct a new levee in that neighborhood at any time.

On the Atchafalaya River the levee work is progressing very rapidly; the enlargement of the levees in Section 1 and Section A is nearly completed, and Sections B and C are covered with large forces which will complete the levee, to my mind, in ample time before next high water,

If it is the intention of the Levee Board to continue levee building on the Atchafalaya River, extending the levees down stream, this should be decided as soon as possible and instructions issued so that the forces might be kept on this work before becoming disorganized. From all appearances the contractors will begin withdrawing forces from the Atchafalaya in about a month and a half from now, as their work will be nearing completion.

After a careful examination of Bayou Latanache, I have come to the conclusion, after consultation with some of the members of the Board of State Engineers, to begin the work of completion of the dike. From all appearances the base which is now in, appears pretty compact and well settled, and we believe, will hold the weight of the superstructure. At any rate, we thought it safe to undertake this work, even though we should have to discontinue it should some settling occur.

The above embodies the result of my observations over the levee line of the Atchafalaya District, and as soon as any new developments appear at Latanache, I shall notify you of same.

Hoping that you are in good health, I am very truly yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., November 28th, 1900.

Col. T. G. Sparks, Prest. A. B. L. D., Musson P. O., La.

DEAR SIR :—Since my return to the city I have gone very thoroughly over the profiles of the levee line from Baton Rouge to Red River Landing. Moreover, I have had a long consultation with Major Derby and Mr. Knobloch about the

various stretches of levee between those points, and I desire to submit to you the following observations, which will enable us to decide where it is best to expend the State funds which have been allotted to the Atchafalaya District.

Going up from Baton Rouge, the following points are lower than our required standard, and require raising and enlargement:

First, the Upper Barroza Stretch. This is about one and three-quarters feet above high water and should be enlarged. It is somewhat exposed to wave-wash at high water. The Government, however, had placed it under contract at one time, and as the contractor failed to carry out his contract it retains a certain sum of forfeit money, which can be expended on this levee. Hence, to my mind, it is desirable for those reasons that the Government should do this work themselves.

Second, the stretch from Rose Hill new levee to Solitude Landing is below standard. This, however, is in front of a caving bank, which has been caving rather violently of late, and where a new levee will in all likelihood be required in a year or two. Moreover, it is exposed to wave-wash. For those reasons I think best not to do that work this season.

Third, the stretch from the lower end of Point Manoir to Arbroth. This is below standard and should be enlarged. The upper end, however, is covered by a growth of willows and is protected from wave-wash. On the other hand, the lower end is exposed to wave-wash, and for that reason is not desirable work for the present.

Fourth, the stretch from Raccourci Landing to Old River at Dick Lacour's Store. This stretch is quite below standard and requires enlargement. It is all of it situated behind a point protected by a growth of willows and other trees, and therefore would not be exposed to wave-wash. Moreover, in 1897, this stretch gave us a great deal of trouble owing to leaks and weak places. A large amount of money had to be spent there at that time in high water fighting. It is true that the levee was somewhat enlarged since that time, but the enlargement put on it was scant, and this stretch is one of the lowest in our district. I believe that it is by far the best stretch for the State to undertake at this time of the year. I

have talked the matter over with Major Richardson and he agrees with me on the subject, so that if you take the same view as we do, we shall advertise this at once and try to cover the whole line before the coming high water, if possible. If the high water surprises us, our work is naturally protected and will not be wave-washed.

I have not spoken of Morganza, because since seeing you and talking with Major Derby, I have come to the conclusion that the capping required can be done more cheaply in connection with the drainage which you propose to do, than if done by itself. When we cut the drainage ditch for Morganza, we will use the earth taken on the land side in cutting this ditch to place the required cap on Morganza, thereby accomplishing a double purpose for a given expenditure. Major Derby agrees with my views about filling the base of Morganza with a hydraulic dredge, so that the enlargement might be made the following low water at a much cheaper rate. In all likelihood he will direct the Government dredge Ram there this coming high water.

Please let me know by wire upon receipt of this letter, whether you agree with our views as to this State work, because it is so late that we are anxious to get in an advertisement as soon as possible and let it out at once.

* * * * * * * *

Very truly yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., NOV. 6, 1900.

Hon: Hunter C. Leake, President Board of Commissioners, Pontchartrain Levee District, New Orleans, La.

DEAR SIR—At your request, I have had prepared the enclosed map, upon which is represented an accurate and true position of the banks, levees and caves of river bank and levees, which have taken place from time to time at Southport and vicinity, covering a period of nearly forty years.

It is only with the information presented to us in this form, can we intelligently arrive at any definite conclusions

as to the present and future conditions in this stretch or bend of the river.

The State is now building some 1,350 feet in length and averaging 17 feet in height of new levee made necessary by the caving into the river in September, 1900, of a portion of a levee, that existed previous to the year 1863; the foreshore of which in that year shows on the map to have averaged over two hundred feet. Upon this bank, after it had caved off or eroded to nearly one-half or more of this width, a steamship wharf and cotton shed, and other improvements were built over and on top of it. In front of a portion of this levee and river bank, and below the cave of September last, the United States government have laid since the year 1890 two spur dykes, and intervening mattresses. The new levee under construction will tie on for this season to the upper end of what is known as the Augustin levee, built in the fall of 1871, the centre line of which was located two hundred and fifty feet back from the levee which was breached by a cave in the river bank in August 1871. In front of this levee of 1871, upon a foreshore of less than two hundred feet, a wharf, grain elevator "A", and other buildings and improvements have been constructed from time to time. In front of this foreshore two spur dykes, one in 1890 and one in 1892, with intervening mattresses, were laid by the U. S. Government. A cave took place July 1900 in rear of spur dyke of 1890, where mattressing had been laid in 1893. This cave is said by the U. S. Engineers to be what is called a surface cave, and does not extend under the mattresses, and it is believed to have been caused, in their opinion, by the weight of what is known as a mud box, which was constructed near the river edge of bank, to protect existing properties on the foreshore in front of the levee from the high waters in the river. The present distance from apex of cave to river base of levee of 1871, just below elevator "A", is about 90 feet.

From a study of the map which represents the past history of this stretch of river, and disregarding what effect the U. S. Government works have done to arrest erosion and caving, the recession of river bank has been from about 200 feet near the upper line of Southport to 300 feet near and below

the lower line of Southport in thirty-seven years. If the erosion and caving were a gradual one, and reasoning by analogy in less than nine years the Augustin Levee of 1871 will be breached. But as it is well known that the caving of river bank, especially in the lower river, is first in scallops or deep pockets, followed in course of a few years by caving and straightening out between scallops, which is clearly demonstrated by comparing the bank lines on map. A scallop or cave may take place after a very high and long period of high water above or below elevator "A", which would breach the present levee of 1871. The weight of elevator "A" would also add to the extent of such a cave.

As to the levee of 1871, it has not served its purpose as a levee, since the erection of elevator "A" and other improvements, for the high waters have been kept from it by the construction of temporary mud boxes near river bank. It may be that this levee is defective from rats harboring and likely perforating the embankment immediately in rear of said elevator. This levee is, moreover, weak in cross section, and not up to what is known as Mississippi River Commission Grade. If it is to serve the purpose of a levee, it should be repaired and strengthened. It was repaired, raised and strengthened in the spring of 1894, but no water was ever subsequently let against it to test its condition.

The levee stands to-day generally about one foot above H. W. M. of 1897, but there are a few low places which are about one-half foot above H. W. M. of 1897. It would take upwards of 7,000 cubic yards to enlarge this levee on the river side, and upwards of 14,000 cubic yards to enlarge it on the land side.

I would not advise at this date the extension of the present line of new levee now under construction to cover this stretch of levee known as the Augustin levee of 1871, for the reason that in my opinion a new levee, even were there no improvements directly in the right of way, could not be constructed without extraordinary efforts on the part of the Levee Board in time for next high water, and with the present conditions and difficulties in the right of way, it would simply mean, excavation of deep pits, near present line of old levee

without the completion of new levee, and probably endangering and making matters more precarious and serious, than to depend on present line of levee of 1871 enlarged and strengthened for another season's protection against high water.

Very respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 14th, 1901.

Hon. Hunter C. Leake, Prest. Board of Commissioners, Pontchar-Levee District, New Orleans, La.:

DEAR SIR—Major Richardson, Chief State Engineer, and myself, have just completed an inspection of the levees in your district from Baton Rouge to the lower limits of the district, Carrollton.

The following table, by parishes, shows what levees require mowing of weeds, and drainage of barrow pits:

EAST BATON ROUGE PARISH.

NAME OF LEVEE.	Station to	Station	Len'th in Feet.	Condition of Levee.
Just bel'w Baton Rouge.	13+49	30+99	1,750	Slightly weedy.
Upper Line Protection Levee			1,500	Slightly weedy.
Magnolia Mound	30+99	79+40	4,841	Weedy.
Gartness	79+40	123+93	4,453	Weedy, about 600 feet, very dirty.
Nestle Down and Arlington	123+93	190+30	6,637	Silghtly weedy.
Hope Estate, Laurel Place and Cottage Plant	190+30	353+64	16,334	Very little weedy.
Conrad Point	353+64	411+80	5,816	Very dirty.
Martinez to Ben Hur Ramp	411+80	557+60	14,580	Slightly weedy.
Ben Hur Ramp to Longwood Store	557+60	648+25	9,065	Weedy.
Longwood Store to Burton Lumber Co. Log Railroad	648+25	690+78	4,253	Slightly weedy.
Burtville to lower end of Parish	690+78	739+45	4,867	Very dirty; barrow pits should be drained.

IBERVILLE PARISH.

NAME OF LEVEE.	Station to	Station.	Len'th in Feet.	Condition of Levee.
Manchac and Granada.	739+45	846+27	10,682	Very dirty; barrow pits should be drained.
Hermitage, Conrad Plant, and Towles	846+27	943+30	9,703	Weedy; barrow pits should be drained.
Billings around Plaquemine Point to upper line of Granada	943+30	1073+59	13,029	Very little weedy.
	1073+59	1138+83	6,524	Weedy.
	1138+83	1225+97	8,714	Very little weedy.
Granada to Magnolia	1225+97	1314+27	8,830	Slightly weedy.
Magnolia to Avery	1314+27	1402+57	8,830	Very little weedy.
Avery to Monticello	1402+57	1447+57	4,500	Slightly weedy.
St. Cabriel to Point Clear	1447+57	1797+57	3,500	Very little weedy.
Blue Bar Settlement	1797+57	—1886	8,843	Very weedy and dirty.
Leper Home and Indian Camp	1886	1972	8,600	Weedy.
Maryland and Hard Times	1972	—2044	7,200	Very little weedy.
Arizona	2044	—2068	2,400	Very weedy.
Rescue to end of Parish.	2068	—2147	7,900	Slightly weedy.

ASCENSION PARISH.

NAME OF LEVEE.	Station to	Station.	Len'th in Feet.	Condition of Levee.
Southwood, Waterloo and Mt. Houmas	2147	—2280	13,300	Very weedy; barrow pits should be drained.
Mt. Houmas, Cottage Farm, Linwood, Belle Helene, and Bowden	2280	—2462	18,200	Very weedy on land side of levee; river side recently enlar'ed by dredge and scarpers; barrow pits should be drained.
Landry to Canty	2462	—2617	15,500	Very little weedy.
Canty to Cut-Off Rood.	2617	—2721	10,400	Weedy; trees on levee on land side should be cut down and roots grubbed out.
Cut-Off Road to Darrowville	2721	—2782	6,100	Very little weedy.
Hermitage	2782	—2849	6,700	Weedy on land side of levee; recent caves of river bank along here, but new levee will not be required this season.
Hermitage	2849	—2945	9,600	Weedy on both sides.
Riverton, Burnside, Orange Grove and Monroe	2945	—3145	210,000	Recently cleaned by Commissioner.

ST. JAMES PARISH.

NAME OF LEVEE	Station to Station.	Len'th in Feet.	Condition of Levee.
Union to St Mary's Chapel Settlement...	3145 —3254	10,900	Slightly weedy.
White Hall to upper end of Nita crevasse.	3254 —3470	21,600	Recently cleaned by Commissioner; at work above White Hall Settlement.
Nita Crevasse.....	3470 —3518	4,800	Weedy on both sides of levee and banquette.
Celestine to lower end of Uncle Sam.....	3518 —3615	9,700	Slightly weedy.
Convent Settlement....	3615 —3741	12,600	Very little weedy.
College Point to Oneida.	3741 —3844	10,300	Slightly weedy.
Oneida to Belmont crevasse.....	3844 —3909	6,500	Weedy.
Belmont Crevasse.....	3909 —3935	2,600	Very weedy at upper end, then slightly weedy; willows on river of levee and land side of banquette should be slashed down to width of berme on river side, and to 25 feet of banquette on land side.
Belmont to Tessier....	3935 —4025	9,000	Slightly weedy.
Tessier to St. Elmo....	4025 —4082	5,700	Weedy.
Longview to Lutcher..	4082 —4238	15,600	Very slightly weedy.
Grammercy.....	4238 —4325	8,700	Weedy.
Sport to end of Parish..	4325 —4358	3,300	Slightly weedy.

ST. JOHN PARISH.

NAME OF LEVEE.	Station to Station.	Len'th in Feet.	Condition of Levee.
Mt. Airy to Angelina..	4358 —4448	9,000	Slightly weedy.
New Hope to Hope.....	4448 —4516	6,800	Weedy.
Hope to Reserve	4516 —4696	18,000	Very little weedy.
Star and reserve.....	4696 —4730	3,400	Slightly weedy.
St. Peter Settlement to Belle Pointe.....	4730 —4833	10,300	Very little weedy.
Belle Pointe to lower end of Woodlawn....	4833 —4987	15,400	Slightly weedy.
Bonnet Carre Levee...	4987 —5171	18,400	Weedy; weeds should be cleared on both sides of levee and also on land side of banquette.

ST. CHARLES PARISH.

NAME OF LEVEE.	Station to Station.	Length in Feet.	Condition of Levee.
Gypsy	5171 —5211	4,000	Slightly weedy.
Gypsy to Good Hope	5211 —5413	20,200	Very little weedy.
Good Hope to Red Church	5413 —5653	24,000	Slightly weedy.
Red Church to Modoc	5653 —5720	6,700	Very little weedy.
Modoc to lower line of Parish	5720 —6021	30,100	Weedy.

JEFFERSON PARISH.

NAME OF LEVEE.	Station to Station.	Length in Feet.	Condition of Levee.
Upper Line to William St. in Kennerville	6021 —6126	10,500	Weedy.
William St. to lower line of Kennerville	6126 —6141	1,500	Very weedy.
Trudeau to Boisblanc	6141 —6271	13,000	Slightly weedy.
Boisblanc to Soniat	6271 —6332	6,100	Weedy.
Soniat to Lafreniere	6332 —6416	8,400	Very weedy.
Lafreniere to Osterly	6416 —6577	16,100	Slightly weedy.
Southwood new levee	6577 —6629	5,200	Very weedy.

Yours respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

SATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 30th, 1900.

Hon. John Dymond, President Board of Commissioners Lake Borgne Basin Levee District, Belair, La.:

DEAR SIR—In answer to yours of the 26th instant I would respectfully state that I have examined the levee and river bank at Scarsdale on the 28th instant, and I found that the bank had not changed to any extent since my last examination.

I have requested Mr. Walston Knobloch, Assistant United States Engineer, to furnish me with a copy of recent survey made for new levee as well as existing bank line, and he has promised me to do so. I would not recommend at this date a horse-shoe run-around, as I do not consider this to be a case of emergency. It is probable that if we have any further caving along this stretch it will not take place in the same spots or scallops, but will cave above or below, but I do not believe any caving will breach the existing levee this year. The present levee is one of ample section, and it is a pity

that it should have to be abandoned. I believe it would be wise to postpone the construction of a new levee on this front to some future date.

Yours very truly,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 20th, 1901.

Hon. John Dymond, President Board of Commissioners, Lake Borgne Basin Levee District:

DEAR SIR—I have the honor to report for your information that members of the Board of State Engineers have inspected and examined the lock of the Lake Borgne Canal, Parish of St. Bernard, lately reconstructed by the Lake Borgne Canal Company, and have witnessed the tests made to show the strength and security of the structure.

The work has plainly been well and faithfully done, and the tests give direct proof of sufficient strength to resist the heaviest strain to which the work can be subjected when the Canal and Lock are in actual use and operation.

The Board of State Engineers, therefore, see no reason why your Board or other authority, should object to the removal of the existing public levee in front of the Lock, and the opening of the Canal so as to connect with the Mississippi River.

Very respectfully,

HENRY B. RICHARDSON,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Nov. 10, 1900.

Hon. George Schoenberger, President Board of Commissioners, Buras Levee District, Buras, La.

DEAR SIR—In my letter to you, dated October 17th, I stated that the Board of State Engineers would undertake $4,500 worth of levee work in your district this season. Under the terms of the John Bowers contract, awarded to Jos.

Hingle at 12⅓ cents per cubic yard, this represents over 36,000 cubic yards of earthwork.

On my return to the office this morning, I find that the approximate yardage in the Mrs. Smith levee is about 3,500 cubic yards, in the George Crombie levee about 4,300 cubic yards, and in the levee at Wenck's Guenin and Vidacovich, 9,500 cubic yards, making some 17,300 cubic yards. These with the John Bowers levee, now under contract, will amount to between 36,000 and 37,000 cubic yards. The character and nature of the three levees mentioned above is practically the same as that of the John Bowers levee, and I do not see why the present contractor, Mr. Jos. Hingle, would not accept them as an extension to his contract. At any rate, we are prepared to issue notes on these levees as an extension of the John Bowers contract, if we are positively assured that we could have them built in time for the next high water. I will design the levee around Mrs. Smith's with a 12-foot crown, land slope of 3 to 1 and river slope of 1 to 1, so that you can revet the same right against the face of the earthwork on the river side. The yardage of 3,500 cubic yards is calculated for such a section of levee at Mrs. Smith's.

Let me know at once if it is possible for your Board to have these levees built under the John Bowers contract, so that I can issue the notes at once. I would advise this in preference, than that the State should advertise for bids on these three small levees, as this would not only mean delay in letting of the same, but I doubt very much whether the State would be able to undertake the constructiou of all three of them; because the probability is that we would not get as low a bid as 12⅓ cents per cubic yard, and with our limit of expenditure in the district of $4,500.

Yours truly,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA.
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., August 21st, 1901.

Hon. Geo. Schoeonberger, President Board of Commissioners, Buras Levee District, Buras, La.

DEAR SIR—The Board of State Engineers, after due consultation upon the condition of the levees in the lower end of

your district, which have been partially destroyed by the recent storm, have concluded that they will rebuild, enlarge, and strengthen these levees, if your Board will see its way clear to have removed all logs and trash that has recently been placed upon them by the storm.

Yours truly,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 30th, 1901.

General T. F. Bell, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR:—I enclose you a map showing preliminary location from Scott's Slough to Sale and Murphy Canal, in your parish, compiled in this office from United States and State surveys. The average yardage will aproximate about 300,000 cubic yards on any line adopted between those two points. It would be far better if it would be possible for you and other prominent levee people in your section to urge upon your Congressmen to push the Red River appropriation in the Rivers and Harbors Bill, as the amount required for this work will approximate $75,000, and it would be a matter of great advantage, both to the State and your district, if the Government would be willing to undertake this work.

Will you kindly let me know whether your Board has any resources in case of the failure of the Government to undertake it, with a view of the contingency arising of the appropriation failing to pass Congress this session. I feel that the construction of this line is of vital importance to the upper portion of the Caddo system owing to the fact that so many new towns have sprung up along the line of T. S. & N. R. R., an overflow of that section would be disastrous to your parish and unavoidable with this gap remaining open.

I hope you will interest yourself in this matter, as no time is now to be lost between the present and the adjournment of Congress on March 4th. I expect to be in your part of the State on the 7th of February, and will remain over to see you.

Yours truly,

M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., March 11, 1902.

Hon W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR:—In compliance with your request, I have secured the necessary information upon which to base a report as to the "feasibility of a project to drain Ferry and Soda lakes," in Caddo Parish, La., and beg leave to submit the following:

Assuming that the levee line in your district above Shreveport will, at no distant day, be extended down to Twelve Mile Bayou, and that the line as a whole, from Blanton Bluff down, will be improved, preserved and maintained, excluding overflows from Red River above, it appears, from the information at hand, feasible to effect and maintain drainage over the the greater parts of Ferry and Soda lakes, except possibly during periods when stages of water in Red River may exceed 17.5 feet on the gauge at Shreveport, or an elevation of 178.8 feet above Cairo Datum, and back up over elevations of surface lower than such a stage.

It should be noted, however, that it will require a stage of water in Red River at Shreveport fully five (5) feet higher than this to seriously affect Soda Lake, alone.

These stages of water at Shreveport have not been exceeded but once since 1895, and then only for a short period, as shown by the following statement giving the high stages reached on the guage at Shreveport for the years named:

Year.	H. W. at Shreveport.		Number of Days on Which Gauge Reading.	
	Gauge Reading	Elevation C. D.	Exceeded 17.5 = 178.8 C. D.	Exceeded 22.5 = 183.8 C. D.
1892	35.6	196.87	108	59
1893	29.1	190·37	96	32
1894	34.4	195.67	96	52
1895	30 3	191.57	36	18
1896	17.5	178.77	2	..
1897	24.1	185.37	29	..
1898	15.0	176.27	..	..
1899	15.6	176.87	..	..
1900	15.0	176.27	..	..
1901	16.8	177.67	..	..

NOTE: The days given in columns 4 and 5 are not necessarily nor usually consecutive.

Forwarded with this report are maps and profile, showing general features and local conditions between Ferry Lake and Shreveport.

To effect the relief of these lakes from rain water, to the extent outlined, will require canal work aggregating about ten miles in length—about two miles in Ferry Lake and eight in Soda Lake—involving the handling of about 600,000 cubic yards of earth work, 91 per cent. of which occurs in Soda Lake.

The section upon which these figures are based contemplates a bottom width of 20 feet, and side slopes of 1½ on 1 for the canal, with cuts of 1 to 9 feet in Ferry Lake, and 6 to 13 feet in Soda Lake.

This canal work cannot be well done by any other means than by dredging, the price of which per cubic yard should not exceed 12½ cents, or a cost of about $75,000.00.

By request of members of your Board, I also wish to report that the distance along a location for a line of levee from the present lower end of your levee system, above Shreveport, (Eric's Point) down to Twelve Mile Bayou—the lower limit of your district, above Shreveport—is about ten miles, and that the extension of your system along that stretch of Red River will require about 450,000 cubic yards.

As mnch of this extension should be placed under contract by your Board, at an early date, as your present means will permit, and the whole be completed as rapidly as further means become available.

The State contract known as the "Lower Section of Scott Slough to Sale and Murphy Canal Levee," in your district, was completed, and final settlement made thereon on February 12th, 1902. Its contents was 112,933 cubic yards, and its cost $19,921.38.

The district contract known as the "Upper Section of the Scott Slough to Sale and Murphy Canal Levee" is not yet completed.

The total contents of this work, when completed, will be 162,529 cubic yards, of which about 136,000 cubic yards were in position on Saturday, the 8th inst., leaving a balance of only about 26,529 cubic yards still to be handled, a task which, with the continuance of fair weather, should, even with the

force now employed, be accomplished within the course of a month or six weeks; and, with the continuance of the low stage of water in Red River, without causing further anxiety to the district.

The Board of State Engineers would again call attention to the wisdom of devising ways and means to properly repair, preserve and protect the lines of levee in your district, many miles of which have been more or less affected by wear and tear, neglect and abuse, and will every day grow less efficient unless given the attention demanded.

I shall endeavor to be present at the meeting of the Board of Levee Commissioners of your district, on the 19th inst., and be pleased to make any further explanations and render any further service that may be required.

Respectfully,

FRANK M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 12th, 1902.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.:

DEAR SIR—In compliance with the request of your Board, embodied in a resolution passed at a meeting held on the 19th of last month, the Board of State Engineers has the honor to submit a report:

The resolution of your Board reads: "It being the belief "of this Board that conditions on Red River have so "materially changed that the territory between Twelve "Mile Bayou, Red River, and the highlands, exempted from "the operations of the act ot incorporation of this district, is "now receiving great benefits from the levee system and "should be again included in the operations of said act, a "report of such conditions, benefits, etc., is hereby requested "from the Board of State Engineers, to be submitted at the "next meeting of this Board, to be used as a basis of further "action by this Board."

The exemption referred to dates back to the year 1894, and embraced the "land bounded by the bluffs bordering

" Soda Lake, Cross Lake and Cross Bayou, from a point at or
" near Albany, where the navigable channel of Twele Mile
" Bayou or Soda Bayou touches said bluffs, to Red River,
" thence by Red River up to the line between Sections 35 and
" 36, T. 19 N. R., 14 W., thence south on the line between
" Sections 35 and 36, T. 19 N. R., 14 W., and Sections 1 and
" 2, T. 18 N. R., 14 W., to Twelve Mile or Soda Bayou,
" thence by the navigable channel of said Twelve Mile or
" Soda Bayou to the point first mentioned at or near Albany."

At that time (1894), the levee line above Shreveport extended continuously *only* from Blanton Bluff, Arkansas, to the lower side of Sale and Murphy Canal, in Caddo Parish, La., about three (3) miles in length, reaching down to a point about two (2) miles below the State line, and from a point about three (3) miles above Red Bayou to Hurricane Bluff Plantation, a length of about 22.5 miles.

The gaps in the line of public levee above Shreveport were therefore, then, as follows: First, from the Sale and Murphy Canal to a point about three (3) miles above Red Bayou about 11.5 miles wide by the river, including the outlets known as O'Rourke's Slough, Scott's Slough or Kunz's Canal, and Hervey's Canal; and second, from Hurricane Bluff Plantation to Shreveport, about 29 miles wide by river.

The Board of State Engineers, at that time had reason to believe that, through the combined efforts of the State, the District and the United States, the gap from Sale and Murphy Canal to Red Bayou, would be eventually closed, and the line below Hurricane Bluff Plantation considerably extended. This would, of course, tend to improve protection against the waters of Red River, its tributaries and outlets, over that part of the district lying above the lower end of the continuous line of public levee, when built, and widen the influence of this protection as the levees might be extended.

The probable cost, however, of constructing that part of the line below the Cuba Plantation, down to Shreveport, appeared so considerable compared with the means available, and the value of the property affected, coupled with the necessity of leaving Cross Bayou open to afford drainage to the large watershed above, from Jefferson, Texas, to Shreve-

port, acting at times as a, necessary outlet, and at others as an injurious inlet, depending upon the stages of water in Red River, that the Board of State Engineers was led to report that "the land within the boundaries described below is so situated as not to be susceptible of protection from the waters of Red River, with the means available under existing laws."

At this date, the line of public levee in the Caddo Levee District, above Shreveport, is continuous from Blanton Bluff, Arkansas, to Gold Point, a length of levee about 40 miles, and a distance by river of 53 miles, closing all outlets or inlets in that distance, materially extending the benefits of protection against the waters of Red River to the land above, and reducing the periods of overflow to which the lands below are susceptible.

A gap, however, still remains, between Gold Point and Shreveport. The width of this gap, by river, is about 21 miles, the levee line to close which is estimated at about 19 miles in length and to require as much as 1,800,000 cubic yards of earthwork, divided as follows: On the upper ten miles (from Gold Point to lower side Cuba Plantation), about 450,000 cubic yards; and on the lower nine miles (from lower side Cuba Plantation to Shreveport), or that part of the levee line required along the river front of the territory exempted, about 1,350,000 cubic yards.

Furthermore, the necessity of leaving Cross Bayou open is as imperative now, and will continue to be so in the future, as at any time in the past, so that even if the levee line was extended so as to include the land described in this exemption, the susceptibility of the greater part, if not all of it, to overflow from the high waters of Red River, backing up over it will remain.

It is, therefore, still the opinion of the Board of State Engineers that the land within the boundaries described is so situated as not to be susceptible of protection from the waters of Red River by the levee district, "with the means available under existing laws."

Respectfully submitted,

THE BOARD OF STATE ENGINEERS,

Per F. M. KERR,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 12th, 1902.

Honorable W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR—As requested, under resolution passed at the meeting of your Board, on the 19th of last month, the Board of State Engineers begs leave to submit the following report in regard to the dam built by the Shreveport Water Works Company across Twelve Mile Bayou, and the "backing up" of water on lands above in consequence thereof.

We are informed that this dam was built within the past year by the Shreveport Water Works Company under authority from the United States, and in accordance with plans accepted by the Secretary of War.

The plan, in general terms, comprehended a close wooden structure across the bed of Twelve Mile Bayou, located immediately below the point of departure of Blind Bayou from Twelve Mile Bayou, the elevation of the crest of which should not exceed that equal to a ten-foot stage of water in Red River on the Shreveport gauge, with a wooden bridge or crossing over the dam five feet higher.

In conjunction with this dam, the channel of the small bayou, known as Blind Bayou, was to be deepened and widened to accommodate the discharge of Twelve Mile Bayou, the aim and object of the whole being practically to transfer the mouth of Twelve Mile Bayou from Old River to Cross Bayou, and deliver the water from Twelve Mile Bayou into Cross Bayou, free of the influences of the waters of Red River, at stages lower than the crest of the dam.

The elevation of the crest of the dam, under this proposition, should not exceed 171.3 Cairo Datum.

A cross-section made over the crest of the dam on the 7th inst., showed that, for a width of 174 feet, equally distributed across mid-stream, this elevation had not been exceeded, and the bridge stood clear five feet above. Beyond this width, however, the crest of the dam rises gradually to near the top of the bank, on each side.

While considerable work has been done in an endeavor to deepen and widen the channel of Blind Bayou, much still re-

mains to be done to conform to the requirements of the plan as originally proposed, and explained to us.

In connection with this examination, an inspection, by skiff, was made up Twelve Mile Bayou, from the dam to the foot of Soda Lake, about opposite Albany, to ascertain from actual observation if any "backing up" of water was occurring, at that stage of Red River, reading 14.2 (or 175.5 C. D.) on the gauge at Shreveport, sufficient to affect lands above.

In no instance was the water in Twelve Mile Bayou, or its tributaries or outlets, found high enough to affect lands above by several feet, but the bayou was, on the contrary, in several localities, serving effectively at that stage as a drainage channel for rain water to considerable areas of land.

Respectfully submitted,

THE BOARD OF STATE ENGINEERS.

Per F. M. KERR,

Assistant State Egineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., February 4th, 1901.

Hon. J. W. Jeter, President, and Members of the Board of Commissioners, Bossier Levee District, Benton, La.

GENTLEMEN—In accordance with your resolution of January 3rd, 1901, I have to report that not being able personally to visit the points named in the communication of your Secretary to me, dated January 5th inst., I requested Mr. F. M. Kerr to make an examination of the points mentioned, and have to report that there has been no changes in any of the points mentioned therein since my last inspection.

I will report that I staked and the State let, in October last, a new levee in front of Gordy Ogden's Plantation, one mile in length, and containing about 38,331 cubic yards. The lower end of this levee throws out about half of the Gold Point Levee, and protects the threatened point in front of Gordy Ogden's place. This work will be completed in a very few days, and finally received.

I have the following to report as to the upper end of your district, viz.:

BOSSIER CITY.

Still obstructed by tramway, saw-mill, and lumber, etc.

DILLARD'S TO BOSSIER CITY.

General condition the same as in Board of State Engineers' report of 1900, except that the wagons are encroaching upon the base, and crossing over without a ramp at the upper end.

HOLLINGSWORTH.

Appearance of levee good, except that owing to weather wash is scant in certain places as compared with original section. Now thoroughly sodded.

PAT CASH.

Upper part of place, grade, crown, and slopes good. Clean and well turfed. Lower part deficient in grade, crown, and slopes. Recently cleaned off and partially repaired by district. Still weedy in places and entirely bald of grass. Deficient road crossing. This part of the line has never been improved by district, but has been maintained by Mr. Cash. But the maintenance of the said portion has been rather in a negative than in a positive way, as he has permitted it to grow up a net work of vines, trees, etc., and shows no disposition to keep his levee up as it should be. I would suggest that this point needs attention, and that whenever conditions will justify it, that a new levee be placed there instead of the present one.

PANDORA.

Scant in Section. Grade, crown and slopes good, though somewhat worn along upper half of levee by stock before grassing. Deficient ramp, and bad pathway upper end near Benoit Bayou. Has not been improved since built in 1890.

BENOIT BAYOU.

River apparently shaping up, and conditions improving; bank rather close, but showing no additional disposition to cave.

BUCK HALL.

Grade, crown and slopes good. Weedy in places, and stretch somewhat worn and bald, but generally clean and well turfed. Caving slowly in front of improvements; 135 feet bank. Has not changed materially within the year.

GOLD POINT.

Grade, crown and slopes good. About one-half covered by the Ogden new levee, shortly to be completed.

FROM RUSHING'S TO ABRAM'S.

Levees have been sadly neglected, and the weeds that were on them through last season have simply been killed by the forst, but will return as soon as spring time opens.

In conclusion I would call your attention to letter sent to your President on October 3rd, last, in which it was my intention to impress you with the fact that maintenance is as important as construction. No State levee funds can be used for other purpose than constructing levees, hence the responsibility devolves upon your Board of maintaining your levees after their construction. I would suggest the system of paid Inspectors, as far as the means of your district will permit, to look after details, such as weed cutting, restoration of wave and weather wash, general wear and tear, to see that the specifications are observed in all levee contracts, to make reports concerning progress of work as directed, to enforce the laws relative to hogs running at large, and to riding and driving on the levees. Such inspectors should be experienced, active and fearless, and should do their work without favoritism.

I would further suggest the setting aside of a certain sum annually for use in maintenance, which when properly handled could be decreased annually, and would give you an ideal levee system, sodded, and true of slope.

Respectfully,
For THE BOARD OF STATE ENGINEERS.
M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., October 2d, 1901.

Hon. J. W. Jeter, President Board of Commissioners, Bossier Levee District, Shreveport, La.:

DEAR SIR—In order to be able, from recent observation, to properly advise you in regard to the most threatenining points in your district, at this time, from caving banks, as requested by your Board at its last meeting, I made an examination of the line of levee from Riverside to Christiana, on the 13th and 14th of last month.

The points in the district where the river bank is gradually approaching the levee line sufficiently to call for your watchfulness, are as follows, viz:

Rough and Ready, distance from centre of levee to edge of bank, 400 feet; Willow Chute, 350 feet; Buck Hall, 135 feet; Pat Cash's, 150 feet; Vinson's, 75 feet; Sunny Point, 145 feet; Gold Dust, 180 feet; Hopewell, 180 feet; and Christiana, 147 feet.

There is no certainty that the river bank at any one of these localities will reach the present line of levee before another flood season has passed, but the levees which will, in the near future, be required at Sunny Point, Gold Dust and Hopewell, will be so much larger, more extensive, and more necessary to the district as a whole, as compared with those which may be required at the other localities named, that their construction may be classed as of first importance, and should probably not be too long delayed.

Of the three places to which attention is thus directed, a breach in the levee line at Sunny Point would prove the most disastrous in the district.

At Rough and Ready and Willow Chute, developments may with safety be awaited. At Buck Hall's, Pat Cash's and Christiana, the levee work which will be required to cover such breaches as may occur, will be neither large in section, nor extensive in length, and its cost should at any time be within the means of the district.

The new levee at Sunny Point will require about 125,000 cubic yards; and that at Gold Dust and Hopewell, which will consist of one continuous line to cover the threatened points on both places, will require about 155,000 cubic yards.

It is not possible for the State, at this time, to undertake the work required at more than one of these localities, payable from the funds available for this season, and the Board of State Engineers would be pleased to have your Board designate which of the two levees named you would prefer having recommended to the Governor for construction at this time.

In regard to the remainder of the levee line in your district, there is but little more that can, at this time, be said

about it, beyond what was recorded in the last general report made to your Board (September 27, 1899), except that the line above Bossier City has been recently cleaned off, and in consequence presents a much improved general appearance.

It is to be hoped that the good work inaugurated above Bossier City will be extended below, and that it will hereafter be systematically continued over the whole length of line, as necessity for it arises.

Respectfully,

FRANK M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., October 15th, 1901.

Hon. J. W. Jeter, President Board of Commissioners, Bossier Levee District, Shreveport, La.:

DEAR SIR—After completing the survey for the Sunny Point Levee, I find that the condition of the bank on the upper side of the point, on the Pruitt Place, is not immediately as threatening as previously believed. Furthermore, that the changes in the bank on the lower side of the levee, on the Hall Place, are very slight as compared with measurements made as far back as 1896, and, except for the fact that the margin between the centre of the levee and the edge of the bank is at one point only 160 feet, it would not seem necessary to build a new levee even there at this time.

However, not wishing to assume the entire responsibility of withdrawing the Sunny Point Levee from the advertisement myself, I have submitted the matter to the members of the Board of State Engineers, and it is the sense of the Board that the construction of a levee across the point is premature, and might be classed as a rather heroic treatment for the locality, but that it would be well to build a new levee covering the stretch of levee on the lower side of the point, on the Hall Place, where all things considered the bank is rather close and at one point only 160 feet distant from the levee.

This new levee will require but about 50,000 cubic yards of earth, while that across the point will require about 125,000 cubic yards.

Bids, will therefore, be received on October 22d for the shorter stretch of levee, and the difference in the contents of the two works will enable the State to consider the construction of some of the other work in the district to which your attention has been called.

Please advise anyone whom you think may intend to bid.

Yours very truly,

F. M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2nd, 1902.

Hon. J. W. Jeter, President Board of Commissioners, Bossier Levee District, Shreveport, La.

DEAR SIR—At the request of your Board, a report dated October 2nd, 1901, was submitted in regard to such points in the district as appeared, at the time, most likely to suffer, in the near future, from caving banks, in order that a selection might be made of such work as might, at that time, be deemed most needed in the district, and recommended to the State for construction out of such State funds as were available to the district from the taxes of 1900 and 1901.

These points were at Rough and Ready, Willow Chute, Buck Hall, Pat Cash's, Vinson's, Sunny Point, Gold Dust, Hopewell and Christiana.

Referring to these localities, the report referred to read: "There is no certainty that the river bank at any one of these localities will reach the present line of levee before another flood season has passed, but the levees which will, in the near future, be required at Sunny Point, Gold Dust and Hopewell, will be so much larger, more extensive, and more necessary to the district as a whole, as compared with those which may be required at the other localities named, that their construction may be classed as of first importance, and should probably not be too long delayed."

"Of the three places to which attention is thus directed, a breach in the levee line at Sunny Point would prove the most disastrous to the district."

After reviewing the situation at each of these localities, your Board requested that the work required at Sunny Point be selected for construction by the State, and I am pleased to say that this work was duly let out and completed.

The line upon which the estimate submitted to you was based, extended across Sunny Point, from the lower side of Pruitt's to the upper side of Childer's place, was 6,124 feet in length, and involved the construction of about 125,000 cubic yards of earthwork.

Upon further examination, however, it was decided by the Board of State Engineers, that this location was probably not fully justified by the conditions existing at the time, and that a shorter line might with reason and safety be substituted.

This line, parallelling the river bank from a point near the lower end of the existing levee across Sunny Point to the upper angle of the Childer's Levee, is 3,124 feet long, contains 51,289 cubic yards of earthwork, and cost $9,437.17.

As this left a balance of the State funds which might still be applied to the construction of further levee work in the district, the Board of State Engineers, after consultation with you, selected that reported as required at the Vinson Place, which was duly let out by contract and is now approaching completion. This levee is 4,224 feet long, will contain, when completed, about 31,000 cubic yards of earthwork, and will cost about $4,464.00.

After undertaking this latter work, a still further balance of the State funds remained applicable to levee work in the district, but not sufficient to permit the State to undertake any of the larger work estimated as required for the new levees described in the report of October 2nd, 1901.

Your views as to the disposition of this balance were then asked, and it was agreed that the amount, as far as it might prove sufficient, be applied to the repair and enlargement of the Willow Bend Levee, at the extreme upper end of your levee system, to the serious condition of which, from the bur-

rowing of "salamanders", the attention of your Board had several times been called by the Board of State Engineers.

This work was then also shortly let out by the State, and is now about half completed.

Since the commencement of this work, however, it has been found that the length of line affected by the burrowing of "salamanders" was much greater than at first discovered, and an extension of the work very necessary.

Arrangements for this extension have also been effected by the State; but the amount required to pay for the work, as extended, amounting to about 58,000 cubic yards, and costing $3,552.00, will exceed that available to the district from the State funds of 1900 and 1901 by about $1,000, which will have to be charged to whatever may be available to the district from the State funds of 1902.

The levee work thus undertaken in your district by the State, payable from the State funds of 1900, 1901 and 1902, therefore, aggregate, to date, about 140,289 cubic yards of earthwork, costing about $22,453.17.

Owing to the fact that no systematic and proper provision for the care and preservation of the lines of levees in the district has yet been made, abuses continue to be visited upon the levees in many localities, reflecting no credit upon the district, and which must certainly sooner or later result in injury to and loss of property, unless arrested and the damages repaired.

Respectfully submitted,
THE BOARD OF STATE ENGINEERS,
Per F. M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 6th, 1900.

Hon. J. G. White, President Board of Commissioners, R. R. A. and B. B. Levee District, Alexandria, La.:

DEAR SIR—I herewith enclose for the information of your Board at the meeting to be held next Thursday, the 19th instant, a report relative to the general condition of the lines of levee in your district, and the present requirements of the same, prepared by Mr. F. M. Kerr, Special Engineer.

I would add that I expect to be present at this meeting and that Mr. Kerr will also be there.

Yours very truly,

HENRY B. RICHARDSON,
Chief State Engineer.

NEW ORLEANS, LA., August 6th, 1900.

Major Henry B. Richardson, Chief State Engineer, New Orleans, La.:

DEAR SIR—As requested, I herein submit for the information of the Board of State Engineers, and that of the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District, a report relative to the general condition and early needs of said district.

LEVEES.

While a very large amount of levee work has been done in the district since its organization in 1890, by the district and by the State, and the benefits derived have been exceptionally gratifying to the district at large, yet the extent of this work has always been dependent upon the means available at the time it was undertaken. Hence, it follows, at this date, that no uniform grade and section prevails in any part of the district, except to a certain extent on Red River.

Here the levee line is generally in good condition, averages fully 3 feet above the highest water of record (1897) with a width of crown of about 6 feet, side slopes of about 3, and 3 to 1, except in a few instances; and to adjust the whole line uniformly to such a grade and section would involve the handling of not more than about 100,000 cubic yards of earthwork.

On Bayou des Glaizes, the character of the work done so far has been of the patchwork order, the line can only be said to be in passable condition, and to improve it to a proper grade and section will require not less than 400,000 cubic yards of earthwork in addition to what the district has now under contract on that stream.

The work under contract, at this date, on Bayou des Glaizes, is as follows: Gray's to Borodino (grade 2 feet above '97, crown 6 feet, slopes 2½ and 2½ to 1) 16,300 feet

long, amounting to about....	60,000	cu. yds.
Yellow Bayou to Simmsport (grade 3 feet above 1897, crown 8 feet, slopes 3 and 3 to 1) 16,495 feet long, about.....	165,000	"
		"
	225,000	"

The greater part of the levee work so far performed on the Atchafalaya River presents considerable more uniformity of grade and section than that on Bayou des Glaizes, but it was designed generally to withstand, with fair promise of success, such high water as had visited it previous to 1897.

Thus, in the latter year, memorable in the history of the district for the success attendant upon its battle for protection agaist the highest water of record, which, at the head of the line on that stream was about 2.5 feet higher than ever before—the relations between the grade of the then existing levee line and the elevation of high water was reversed, thus transferring the danger from overtopping during that year from the lower to the upper end of the line and requiring a re-adjustment of grade for future operations.

To re-adjust this grade to an elevation of 3 feet above the high water of 1897, with proportionate cross-section (crown 8 feet wide and slopes of 3 and 3 to 1), as much as 600,000 cubic yards of earthwork will be required.

To this should be added the work required in extensions below Melville, amounting to not less than 750,000 cubic yards, making a total of 1,850,000 cubic yards of earthwork for the construction of which the district should provide.

As this, however, is not likely to be within the means of the district at this time, nor in the near future, I would suggest that the needs of the following stretches of levees be first considered:

	Cub. Yds.
ON RED RIVER.	
From Sandy Bayou to Cut-Off Bayou, enlargement.....	30,000
ON BAYOU DES GLAIZES.	
From Rusk's to Marshall's Stations, 1153 to 1418+70, enlargement	70,000
ON THE ATCHAFALAYA RIVER.	
Simsport to Cason's (Stations 2541 to 2910).....	195,000
Turner's Bayou to Harvey's Bayou (Stations 3045 to 3191).....	45,000
Green's Store to Home Place (Stations 3151 to 3191).....	15,000

Home Place to Steven's Spur (Stations 3223 to 3297)	35,000
Dickey's to Berger's (Stations 3347 to 3434)	40,000
Berger's to Scotland (Stations 3451 to 3480)	15,000
Scotland (temporary)	3,500
Richards to Churchville (Stations 3641 to 3682)	10,000
Churchville to Melville (Stations 3693 to 3865)	50,000
Bayou Petite Prairie (4,000 feet, including only the bayou and wings)	100,000
Total	608,500

Part of the cost of this can, I presume, be assumed by the State out of the amounts usually allotted annually to the district from the Natchitoches Sub-District Levee Fund, and from the General Engineer, aggregating generally about $20,000.

The stretches of levee in the district upon which improvement would thus be postponed until further means are available, are either less subject to the direct influence of overflow, as for instance from "the Junction to Moreauville" (105,000 cubic yards); or they are as much as two feet above the high water of 1897, with reasonably adequate section, such as the stretches of levee which withstood the high water of 1897, without topping or enlargement, and those which have been partially improved since 1897; or the conditions are such as to render it advisable to await developments before deciding upon the character and extent of the work to be performed, as at the Scotland Place, where uncertainty as to the stability of the river bank exists.

To enlarge the levee at the Scotland Place will require about 17,500 cubic yards, and to build a new levee there about 50,000 cubic yards.

I think it would be well, however, for the present to confine any work at this place to what may be required to simply enlarge a particularly deficient portion of it (about 900 feet in length) to compare with the levees just above and below it, which would require not more than about 3,500 cubic yards, as before shown.

Again, the line surveyed to extend the system below Melville, from the T. & P. embankment to a safe point below Bayou Petite Prairie, calls for about 350,000 cubic yards.

This entire line should if possible be built, but if the cost of the whole line should operate against the execution of any part of the levee work required above Melville, then the amount of work to be done upon it at this time, should be limited to the closure of Bayou Petite Prairie and a sufficient length of levee above and below to protect the dike from water running around the ends in extreme high water. This would, as shown in preceding statement, require about 100,000 cubic yards.

Failure to close this bayou at an early date will each season cause greater hardship to the country affected, and render its execution more difficult and expensive, its enlargement, after each high stage in the Atchafalaya being very marked.

Whatever levee work the district determines to do this season should be placed under contract with as little delay as possible.

DRAINAGE.

While the law under which the district operates authorizes it to do drainage work, it is a grave question in my mind whether the law ever meant that the district should do any more work in that direction than would be rendered necessary to maintain a condition of affairs equally as favorable to drainage as existed before the closure by levees of channels previously affording natural drainage.

On this line, a limited amount of drainage work has been performed by the district to relieve the Choctaw Swamp and the Big Bend Swamp. In neither instance has the result proved entirely satisfactory. Absence of means limited the character of the work, and impaired its efficiency.

However, under the provisions of a recent act of the General Assembly (Act No. 49), additional resources have become available to the district, and it is stipulated that the proceeds of $150,000 of the bonds authorized to be issued shall be used for drainage, thus rendering it possible for the district to operate in the field of drainage on a much larger scale than heretofore.

In this connection, therefore, the relief of the Choctaw Swamp and the Big Bend Swamp, first presents itself for

consideration, and it would be well for the district to fully discuss and determine the extent to which the work required to relieve these two basins should be carried, bearing in mind that once started out in this direction, the claims of numerous other localities for equal consideration will be presented.

Preliminary surveys for determining the location, grade and section of a main line of drainage to afford relief to the basin below Alexandria, lying between Red River, Bayous Robert and Bœuf, and the Avoyelles Prairies, have been under way for the past month, but owing to the continuous rains which have prevailed, but little progress has been made, and for the present the surveys have been discontinued, to be resumed as soon as favorable conditions return.

Very respectfully.

F. M. KERR,

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., October 3d, 1900.

Hon. J. G. White, President Red River, Atchafalaya and Bayou Bœuf Levee Board, Alexandria, La.

DEAR SIR :—Having made an inspection over the levee lines of your district in company with Major Richardson and Mr. Kerr, it was decided to again impress you with the fact that your levees represent the expenditure, both on the part of the federal and state governments and your district, of a vast sum of money and that maintenance is as important as construction. No State levee funds can be used for any other purpose than construction. Hence, the responsibility devolves upon your Board of maintaining your levees after their construction.

We would suggest that inasmuch as the system of paid inspectors has in most cases proven very satisfactory and the results obtained from them justify us in requesting the permanent employment of one or more in your district to look after details such as weed cutting, restoration of wave and weather wash, and general wear and tear, to see that the specifications are observed in all levee contracts, to make reports concerning progress of work as directed, to enforce the laws relative to hogs running at large, and, to riding and driving

on the levees. Such inspectors should be experienced, active and fearless and should do their work without favoritism.

We would further suggest the setting aside of a certain sum annually for use in maintenence, which, when properly handled, could be decreased in amount annually and would give you an ideal levee system, sodded and true of slope.

Respectfully,

M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., October 23d, 1900.

Judge J. R. Thornton, Secretary Board of Commissioners, R. A. and B. B. Levee District, Alexandria, La.:

DEAR SIR—By request, I beg leave to report that last week, Assistant State Engineer M. P. Robertson and I, in the interest of drainage, made an examination of the low lands in that part of your district, in St. Landry and Avoyelles Parishes, lying between Bayou des Glaizes, the Atchafalaya River and Bayous Courtableau, Bœuf, Huffpower and Rouge.

The result was eminently satisfactory, the additional information obtained confirming the opinion already expressed, namely, that the successful drainage of Big Bend, and of the basin below, by way of the existing chain of bayous, old State canals and lakes, was simply a question of cost.

We also visited little Bayou des Glaizes and Pearl Lake, but owing to the length of time already expended on the trip, concluded to return to the office for a few days, and resume the examination next week, starting from Alexandria, where we hope to see you and have a conference with you.

In this connection we thought it might be well to advise you in advance that the first work in the interest of drainage which will probably be recommended to your Board for execution, will be upon the old State canal, between Turner's Bayou and Bayou Jack; and upon Bayou du Lac, Lake Pearl and Little Bayou des Glaizes, from the vicinity of Three Prong Lake to Bayou des Glaizes; and that the Board of State Engineers will be prepared very shortly to furnish your

Board with the necessary estimates, lists of dimensions, and specifications for the work, herein, named.

This recommendation, however, will be only in line with the following argument, namely: that for the early relief of certain localities, where conditions have already been in a congested state for a long time, the work proposed to be done for the improvement of drainage throughout the basins affected, should be divided into special sections, and the latter treated in the order of their relative importance, until the whole be made continuously operative, just as your levee system has been built up to its present state of efficiency.

But in opposition to this, the question of the ultimate cost of the whole work of drainage, at present contemplated in your district, may perhaps warrant the expenditure of further time to enable you to present and undertake the work for construction as a whole, thereby inviting attention and competition from large operators, which would probably not be the case if the work be advertised and let out piecemeal.

As outlined before, the only objection to the latter proposition will probably emanate from localities which have already suffered for a long time from inadequate drainage, and where in consequence the patience of immediate dwellers has been about exhausted.

In fine, the mode of proceedure in the premises is one of policy, and should be determined by your Board.

I will try to let you know upon what day to expect Mr. Robertson and myself. With regards, believe me,

Yours very truly,

F. M. KERR.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 1st, 1901.

To Hon. J. G. White, and to the Members of the Board of Commissioners of the R. R. A. and B. B. Levee Distirct, Alexandria, La.

DEAR SIRS—I have prepared the following estimate of yardage required to place the levees of the Red River, Atchafalaya, and Bayou Boeuf Levee District, from Simmsport to

Bayou Petite Prairie, on the Atchafalaya River, to a grade 3 feet above High Water of 1897 at Simmsport and Woodside, and 4 feet at Melville. The estimate is based on an 8 foot crown, with side slopes of 3 to 1.

The old embankments have mostly a 2 to 1 slope on the land side, and by adjusting the land edge of the crown of the new earth to a 3 to 1 slope from the land toe of present levee, it will throw the earth considerably riverward; thus we have the advantage of berme. (In many places, especially so in the Bayou Rouge to Melville stretch, the bank does not justify such section, and may be modified.)

The following statement, however, is based on the above described dimensions, and is submitted to you for your consideration:

Sec.	Station to Station.	Name of Stretches.	Cubic Yards Required.
1.	2650+50 to 2791+90	Simon Block to Winn Tract	85,000
2.	2791+90 " 2938	Winn Track to Mr. Cason	80,000
3.	2938 " 3052	Mr. Cason to Woodside	60,000
4.	3052 " 3191	Woodside to Home Place	75,000
5.	3191 " 3372	Home Place to Mansil Richard	60,000
6.	3372 " 3494	Mansil Richard to Scotland	70,000
7.	3494 " 3693	Scotland to Bayou Rouge	75,000
8.	3693 " 3865	Bayou Rouge to Melville	95,000
			600,000
9.	0 to 160 (New Levee)	Melville to BayouPetite Prairie	230,000
	Total		830,000

The estimate for new levee from Melville to Bayou Petite Prairie—160 stations long, more or less—is based on an 8 foot crown and 3 and 3 to 1 slopes, banquette 10 feet below net grade, muck ditch $6\frac{1}{2}+3$ x 5 for whole length.

Respectfully submitted,

M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 6th, 1900.

To His Excellency W. W. Heard, Governor of Louisiana, Baton Rouge, La.:

SIR—In accordance with your directions I attended the recent meeting of the Mississippi River Commission in New York.

The Commission met on Monday, June 25th, and held daily sessions thereafter until Friday, the 29th.

Representatives of a number of the Levee Boards of Missouri, Arkansas, Mississippi and Louisiana, and of several interests connected with the improvement of Memphis harbor were present, and also Congressmen Vandiver and Ransdell.

Some twenty-five persons addressed the Commission, among them the following parties from Louisiana: Mr. Ransdell, M. C.; Mr. Leake, President Pontchartrain Levee Board; Mr. Marks, Attorney Lafourche Basin Levee Board; Mr. McClellan, President Fifth Louisiana Levee Board; Mr. Parker, President Tensas Basin Levee Board, and myself.

I did not think it necessary to address the Commission at length; but confined my remarks to a brief statement relative to the importance of considering the amount of levee work that would become necessary this season on account of caving banks for the maintenance of the existing system in Louisiana, especially in the Fifth Louisiana Levee District, and to the need for extending certain bank revetments.

The appropriation carried in the Sundry Civil Bill this year for the improvement of the Mississippi River, was $2,250,000. Of this sum the Commission allotted $1,000,000, or about 44½ per cent. for levees, distributed as follows:

Upper St. Francis District, Missouri	$ 20,000
Lower St. Francis District, Arkansas	114,500
White River District, Arkansas	50,000
Upper Yazoo District, Mississippi	94,000
Lower Yazoo District, Mississippi	150,000
Upper Tensas District, Arkansas and Louisiana	300,000
Lower Tensas District, Louisiana	110,000
Atchafalaya District, Louisiana	55,000
Lafourche District, Louisiana	28,000
Barataria District, Louisiana	14,000
Pontchartrain District, Louisiana	50,000
Lake Borgne District, Louisiana	14,500
	$1,000,000

The allotments for levees in which Louisiana is directly interested amounts to $571,500, or about 57 1-6 per cent. of the total allotment for levees.

The Commission also allotted $375,000 for bank revetment in which this State is interested, viz:

Lake Providence, Louisiana	$ 75,000
Kempe, Louisiana	150,000
Natchez and Vidalia, Mississippi and Louisiana	150,000
	$375,000

The State of Louisiana, I think, should be well satisfied with the action of the Commission in the allotment of funds at its disposal.

Very respectfully,

HENRY B. RICHARDSON,
Chief State Engineer.

Copy of Memorandum Submitted to Mississippi River Commission, June 25th, 1900.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., June 19th, 1900.

List of new levees needed within one year and probably required within the next two years on the Mississippi River in Louisiana, with contents estimated to Mississippi River Commission Grade, crown 8 feet, slopes 3 and 3 to 1, and banquette when considered necessary, 20 feet wide, 8 feet below grade.

Fifth Louisiana Levee District.

Name of Levee.	Miles Below Cairo	Cubic Yards.	Remarks.
U. S. Upper Tensas District.			
Illawara	566	1,560,000*	
Ditchley	577	346,900	
Cabin Teele	588	192,000*	
Duckport	590	83,700*	
Youngs Point	594	189,800	
Upper Biggs	603	340,000*	
Total U. S. Upper Tensas District		2,712,400	
*Should be built this year		2,175,700	
Remainder probably required within two years.		536,700	
U. S. Lower Tensas District.			
Claggett	644	120,000	Not required if bank is revetted.
Kempe	657	1,500,000	Not required if bank is revetted.
Sycamore	693	225,000*	
Vidalia	700	75,000	
Arnauldia	702	75,000	
Moro	708	72,000	
Greens	721	200,000*	
Upper Glasscock	724	200,000	
Lower Glasscock	727	200,000*	
Fairview	728	30,000*	
Bougere Crevasse	738	1,800,000	
Total U. S. Lower Tensas District		4,497,000	
*Should be built this year		655,000	
Remainder probably required within two years.		3,842,000	
Total Fifth Louisiana Levee District		7,209,400	
*Should be built this year		2,830,700	
Remainder probably required within two years.		4,378,700	

Atchafalaya Basin Levee District.

Name of Levee.	Miles Below Cairo.	Cubic Yards.	Remarks.
U. S. Atchafalaya Basin Levee District.			
Barbre	763	20,000	
Torras	765	235,000*	
Fordoche	788	520,000	
Lower Grand	790	213,000	
Solitude	816	402,000	
Limerick	835	90,000*	
Hickey	841	262,000*	
Eliza	842	165,000	
Bayou Goula	867	212,000*	
Cora	870	133,000	
Total Atchafalaya Basin Levee District		2,252,000	
*Should be built this year		799,000	
Remainder probably required within two years.		1,453,000	

Lafourche Basin and Buras Levee Districts.

U. S. Lafourche District.			
Star	932	92,000*	
Cooperville	944	25,000*	
Cooperville (Lower)	944	23,000*	281,000 cubic yards in State Lafourche Basin Levee District.
Orange Grove	946	25,000*	
Marrero	959	35,000*	
*Total should be built this year		200,000	
U. S. Barataria Levee District.			
Live Oak	991	11,000*	
Alliance	998	40,000*	
Lower Magnolia	1011	30,000*	
Treadaway	1019	8,000*	33,000 cubic yards in State Buras District.
Buras Church	1035	13,000*	
Mrs. Smith	1037	12,600*	
*Total should be built this year		114,600	
Total should be built in Lafourche and Buras Levee Districts		314,600	

Pontchartrain Levee District.

Name of Levee.	Miles Below Cairo.	Cubic Yards.	Remarks.
U. S. Pontchartrain Levee District.			
Celestine	900	75,000*	
New Hope	917	190,000*	
Louque	927	70,000*	
Diamond	934	90,000*	
Sauve to Boisblanc	949	160,000*	
Perkins	951	60,000*	
*Total should be built this year ...		645,000	

Lake Borgne Basin and Grand Prairie Levee Districts.

U. S. Lake Borgne Levee District.			
Scarsdale	985	35,000*	
Belair	995	90,000*	
Fairview	996	25,000*	150,000 cubic yards in State Lake Borgne Levee District.
Edgerson to Burton	1021	12,000*	In State Grand Prairie District.
*Total should be built this year....		162,000	

RECAPITULATION.

ARRANGED ACCORDING TO U. S. LEVEE DISTRICTS.

District.	Should be built this year.	Remainder required within two years.	Total.
U. S. Upper Tensas	2,175,700	536,700	2,712,400
U. S. Lower Tensas	655,000	3,842,000	4,497,000
U. S. Atchafalaya.....	799,000	1,453,000	2,252,000
U. S. Lafourche	200,000		200,000
U. S. Barataria.....	114,600		114,600
U. S. Pontchartrain.....	645,000		645,000
U. S. Lake Borgne	162,000		162.000
Totals.....	4,751,300	5,831,700	10,583,000

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 10th, 1901.

Col. C. Harrison Parker, President Board of Control State Penitentiary, Baton Rouge, La.:

DEAR SIR—In accordance with the request of your Honorable Board, transmitted through the Governor of Louisiana, I proceeded to Angola Plantation and began the surveys required by your resolution in order to establish the acreage of said place. I have made a certain progress in this matter, having established the river boundaries of said plantation. In order to establish the land boundaries of same, however, it is necessary that I should be furnished with a description of the boundary lines of the property belonging to the estate of S. L. James. I, therefore, suggest that you should call upon the estate of S. L. James to furnish you officially with a copy of said boundaries, describing the limits of their property, and that this information be forwarded by you to me, so that I might officially establish them on the grounds.

With regards, I am very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 20th, 1901.

Col. C. Harrison Parker, President Board of Control State Penitentiary, Baton Rouge, La.:

DEAR SIR—Your letter of the 24th instant, was duly received. In answer I will state that I have conferred with Mr. S. L. James, and he has filed with me a list of the rear boundaries of the Angola property, exclusive of the lake Killarney Place. These rear boundaries will be run in accordance with the memoranda which he has filed with me, and the area between these lines and the river bank as established in accordance with your resolution of December 11th, will be

calculated and forwarded to your office as soon as the work can possibly be done.

Very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Jan. 28, 1901.

Col. C. Harrison Parker, President Board of Control State Penitentiary, Baton Rouge, La.

DEAR SIR—Your letter of the 26th inst. was duly received. In answer, I will state that in accordance with your letter of the 24th inst., I am pushing with all possible haste the surveys of the Angola property, exclusive of the Lake Killarney place, on the lines furnished by Mr. S. L. James.

I note in your letter of the 26th inst. that you refer to certain "official documents on record at the Parish seat to "show the area included in that tract (Killarney tract) in-"dependent of any survey." If you can procure a copy of said documents and have them forwarded to this office, we will be glad to examine them and report to you as to their apparent accuracy.

Very respectfully yours,

ARSENE PERRILLIAT,
Asst. State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 31st, 1901.

Judge G. A. Killgore, Secretary Board of Control State Penitentiary, Baton Rouge, La.:

DEAR SIR—Enclosed please find construction notes for the enlargement of the Angola levee between Station 324+38 and 356+11. After consultation with Mr. James and a personal inspection of the levee line, I concluded that this is the work which should be first undertaken upon the levees. Of course, a great deal more than this will have to be done, but this seems to be the worst stretch, and therefore, the one requiring attention first.

The dimensions to which this enlargement is to be built are in accordance with the standard dimensiens adopted by the River Commission and followed as much as possible by the State and district levee authorities. It is the standard to which your Honorable Board instructed me to prepare plans and specifications after I had consulted with it.

Very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Feb. 8, 1901.

Col. C. Harrison Parker, President Board Control State Penitentiary, Baton Rouge, La.

DEAR SIR--In accordance with a letter from Governor W. W. Heard, dated December 12th, 1900, and addressed to Major Henry B. Richardson, Chief State Engineer, which was accompanied by a copy of resolutions passed by your Honorable Board on December 11th, 1900, I proceeded to make a survey of the lands of the West Feliciana Planting Company, purchased by your Board, in order to determine their acreage.

On December 19th, I conferred with your Honorable Board in Baton Rouge and ascertained your views with regard to that part of said resolutions stating that "these terms re-" quire that the line shall run fifty (50) feet back of the river, " when bank full."

In accordance with the views then expressed by your Board, I proceeded to make a survey of the lands owned by the West Feliciana Planting Company. In doing this, however, I found that although I could define the boundaries of this property as limited by the river and defined by your resolutions, yet, in order to ascertain the rear or land boundaries of said property, it was necessary for me to have a description of the lines bounding said property. I, therefore, addressed you a letter, dated January 10th, 1901, requesting that your Honorable Board procure from the estate of S. L. James a description of said boundaries and forward same to me. On January 24th, after your Honorable Board had con-

ferred with Mr. S. L. James on the subject, I received a letter from you requesting me to "give us the area in acres of the "West Feliciana Company lands, exclusive of the Lake Kil-"larney place. Mr. James will show you the lines of these "places we wish surveyed." Mr. James, on the same day, forwarded me a letter, giving me a description of the boundary lines which limit the property of the West Feliciana Planting Company, exclusive of the Lake Killarney place. A copy of this letter is herein enclosed and marked "A."

In accordance with this description and the river bank line survey as above mentioned, I determined by careful survey that the acreage of the West Feliciana Planting Company's lands, exclusive of the Lake Killarney Place, amounts to 7,072.02 acres.

In addition to this, Mr. James has filed, this morning, with me, a certified copy of the acreage of the Lake Killarney Place as extracted from the records on file in the Clerk's office of the Parish of West Feliciana. This certificate is herein enclosed and marked "B." It states that the Lake Killarney Place is composed of, viz:

		ACRES.
1st.	Part of Mary Lane tract	200
2d.	James Ratliff tract	337.87
3d.	Robt. Russel tract	315.12
4th.	Part of the James Perrie tract, 500 arpents, which is equivalent to	422.4
5th.	Section 23 purchased from State of Louisiana under improvement scrip	374.14
	Making a total of	1,649.53

This amount, gotten from the above mentioned source, and added to the $7,072.02 acres, which was ascertained by actual surveys, gives a total of 8,721.55 acres as the area of the lands of the West Feliciana Planting Company.

Very respectfully,

ARSENÉ PERRILLIAT,
Assistant State Engineer.

"A."

NEW ORLEANS, LA., January 24th, 1901.

Col. Arsene Perrilliat, Assistant State Engineer, New Orleans, La.:

DEAR SIR—In accordance with the conference which I held with the Board of Control of the State Penitentiary yesterday, and in accordance with a letter forwarded to you by said Board and dated January 24th, I beg to state that the following are the interior boundaries of the Angola Plantation, exclusive of the Lake Killarney Place.

At the upper end of said place, the boundary lines start at the intersection of a line forming the prolongation of the Tunica Road and the bank line of Angola, as defined by a resolution of the Board of Control, passed December 11th, 1900, a copy of which resolution I think is on file in your office. From this point of intersection the line runs generally in a southwesterly direction following the centre of what is known as the Tunica Road until its intersection with what is known as the Three Bridges Road. Thence the line follows the centre of said Three Bridges Road in a generally southwesterly direction until it intersects the centre of what is known as the Bellevue Road. Thence the line follows the centre of the Bellevue Road in a generally southeasterly direction until it intersects the levee line of the lower Angola Plantation, somewhere in the neighborhood of the old drainage station. The line is then prolonged with the same bearing until it intersects Loch Lomond Bayou, somewhere near the lower end of Sugar Lake. Thence the line meanders the centre of Loch Lomond Bayou until the mouth of said Bayou into the Mississippi River is reached. At that point it intersects the river bank line as established in the resolutions of the Board of Control above referred to. The area between these lines and the river bank line established will be the area of the Angola property, less that of the Lake Killarney Place.

Very respectfully,

S. L. JAMES,

President West Feliciana Planting Company.

STATE OF LOUISIANA,
PARISH OF WEST FELICIANA,
CLERK'S OFFICE, February 6th, 1901.

I hereby certify that the Lake Killarney Plantation, owned by the West Feliciana Planting Company, in the Parish of West Feliciana, contains according to the records on file in the Clerk's office of said Parish, seventeen hundred and twenty-seven 13-100 acres, composed of the following tracts, to-wit:

		ACRES
1st.	Part of the Mary Lane tract, two hundred acres	200
2d.	James Ratliff tract, three hundred and thirty-seven and 87-100	337.87
3d.	Robert Russell tract (three hundred and fifteen and 12-100)	315.12
4th.	Part of the James Perrie tract, five hundred arpents	500
5th.	Section 23, purchased from State of Louisiana under improvement scrip, three hundred and seventy-four and 14-100	374.14

(Signed) A. VILLERET,
Clerk and Ex-Officio Recorder 24th Judicial District.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Feb. 23, 1901.

Hon. C. Harrison Parker, President Board of Control, State Penitentiary, Baton Rouge, La.

DEAR SIR—I received, this day, a letter from Mr. S. L. James, enclosing two documents, which I hereby transmit to you. These documents are in further explanation of those which accompanied my report to you dated February 8th, 1901.

Document marked "C" is a copy made of the dissolution of partnership between Louis Trager and S. L. James. This copy was made from the original certified copy now in the hands of the Attorney General, and which forms part of the title deeds of the Angola Plantation. This document recites the boundary lines of the Angola, Loango, and Bellevue Plantations, and it is from this description that Mr. James procured the information contained in his letter to me describing the Angola, Loango and Bellevue Plantations, a copy of which letter was mailed to you on February 8th, and was marked document "A". On said document "C" I have marked in red ink that part which describes the boundaries

of the Angola, Loango and Bellevue Plantations. I have carefully compared the letter which Mr. James filed with me and the description of the boundary lines of these properties as gotten from the enclosed abstract marked "C", and I find that they agree, and that, therefore, the description given by Mr. James is truthful and correct and substantiated by this copy of the Court records. This further shows to my mind that the survey which I made of the Angola, Loango, and Bellevue Plantations, in accordance with the description given by Mr. James, is a correct survey of these places, and, as stated in my letter of February 8th, these three places contain 7,072.02 acres.

The other document which I enclose to you, and which is marked "D", is a certified copy of the inventory taken in the Succession of Isaac Franklin, on May 29th, 1846, showing the acreage of the Lake Killarney Plantation. The figures given therein are practically the same as those given in document "B", and forwarded to you on February 8th, 1901, and therefore deserves no further explanation than that made in the letter just referred to.

Very respectfully yours,
ARSENE PERRILLIAT,
Asst. State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., October 1st, 1901.

Col. C. Harrison Parker, President Board of Control State Penitentiary, Baton Rouge, La.:

DEAR SIR—I send you this day, under separate cover a blue print of your Angola plantations, showing the levee line as it now exists around part of this property. The levee line has been measured and numbered by stakes, which were placed in the ground at the time of the survey, in January. These stakes are probably now gone, but the angles, the number of which are given on the map, can be located with regard to existing buildings; and therefore the enumeration of the map can be identified with the angles and enumeration on the ground, even though the stakes are no longer there.

Accompanying this blue print is a profile giving the height of the levee with regard to the highest water mark, that of 1897. The heights were taken at every 100 feet in length of the levee, and the profile proper gives elevations which are discernible to every tenth of a foot. The numbering of this profile corresponds with the numbering on the map; and you can therefore know the exact height of any part of your levee line by examining the profile and locating the profile number on the map. The dotted line represents the water mark of 1897, and you see whether the top of your levee is below the top of this water mark.

Hoping that this will be of service to yon iu the work which you may desire to do on your levee line, I am,

Very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

COPY OF LETTER RELATIVE TO PROJECT FOR A BACK LEVEE IN THE PARISH OF PLAQUEMINES.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 26, 1902.

Hon. John Dymond, Chairman of Meeting Held for the Purpose of Inaugurating a Back Levee on the East Bank of the Parish of Plaquemines.

DEAR SIR—In answer to a communication of the 19th of February, 1902, requesting the Board of State Engineers "to "make a report upon the project of erecting a back levee in "that section of the Parish of Plaquemines embraced within "the upper line of Harlem Plantation and the lower line of "Mrs. Baker's Plantation, known as "Old Quarantine," includ- "ing in said report an estimate of the cost necessary for the "erection of said levee, recommendations as to the system of "drainage to be adopted, and the cost thereof and the loca- "tion of the necessary levee line within its dimensions, and "report the same to the Chairman of this meeting at the "earliest date practicable;" we beg to state that:

In deference to the wishes of the people of that section of your Parish, as expressed in the above request, the Board of

State Engineers have made a preliminary survey, locating a line for a back levee at intervals of about one mile, at about the edge of the swamp grass, which we found by our survey and by comparison with the most available and reliable data from precise levels taken in 1893 and the contours therefrom on Charts Nos. 79, 80, 81 and 82 of the survey of the Mississippi River (Scale 1:20,000) as published by the Mississippi River Commission, to be on ground generally less than a foot above Mean Gulf Level.

The following table will give you a summary of these distances between miles:

MILES.	DISTANCE IN FEET FROM RIVER TO LINE OF BACK LEVEE.				
	Greatest	Locality.	Least.	Locality.	Mean.
1 and 4	5,600	Savoie	2,800	Harlem	3,750
4 and 8	4,950	Gagne	2,800	Catholic Church	3,570
8 and 14	4,000	Bohemia Upper Line.	3,000	Bohemia Lower Line.	3,650
14 and 18	3,520	Mrs Cannon	2,600	Edwin Sims	2,900
18 and 23	4,900	Henry Taylor	3,000	Mrs. Burton	3,800
23 and 27	3,900	Noel Buras	2,000	Nicholl's P. O.	3,200
27 and 31	3,000	Above Sea Gull Farm.	2,000	Below Sea Gull Farm.	2,500

The area of land between the front levee on the Mississippi River and the back levee will approximately be 13,500 acres. The length of the line will be about 171,600 linear feet, or 32½ miles, and the average height 7.3 feet, at an elevation of 2 feet above the highest storm water. With a crown of 6 feet and side slopes of 3 on 1, the cubical contents would be 1,287,000 cubic yards, or about 8 cubic yards per linear foot.

As to an estimate of the cost of such a levee, we can only be guided by the proceedings of the Grand Prairie Levee Board, at a meeting held on the 6th of February, 1899, when sealed proposals were received for the construction of a back levee located on a portion of the present line, but of smaller dimensions, averaging 22,000 cubic yards per mile for the construction of which the lowest bid received was from Messrs. Rogers & Wright, Dredge Contractors, at $1,980.00 per mile, or at the rate of nine (9) cents per cubic yard.

In the construction of this levee as a necessary adjunct, devolves a system of drainage. As the rear lands adjacent

to this back levee and for some distance to the front lie at so slight an elevation above Mean Gulf Level, that to reclaim them for thorough cultivation, would require artificial means; but as these fields are utilized almost entirely for the producduction of rice, a cereal that thrives and requires great moisture and constant irrigation, drainage by gravitation is the simplest and most effective method, and not beyond the means and control of the property holders.

This would necessarily involve the construction of drain sluices of prescribed dimensions and placed through the levee at respective intervals, where the outfall would be most effective. It is estimated by those directly interested in this project, that a sluice of about 15 square feet, placed in the levee at intervals of 1800 feet, or about three to the mile, will give as good, if not better service, than the existing ditches to the outfall; and that the cost of one of these sluices, based on the amount of lumber required in its construction, about 2,500 feet Board Measure, and the labor of placing same through a levee of 50 feet base, would be inside of seventy-five dollars. That these sluices should be made of good sound cypress, well anchored into the levee, with a flood gate of the simplest arrangement for opening and closing, is self-evident. In the construction of the levee, the excavation for obtaining the necessary earth if taken on the inside, the pit could be shapened into a canal to serve the purposes of drainage for the rear lands, and we see no good reasons for not making the excavation on the inside, especially if the work is to be done with a dredge, unless it be the fear of expropriating land. If the excavation is to be made on the outside of the proposed levee, it would necessitate the digging of a canal on the inside, in order to drain the rear lands. The front or higher land in either case will require cross ditches and leading ditches to the outfall or sluice. The existing cross ditches on many of the improved properties included in the area can be utilized. To determine exactly the lengths of the main ditches as required in the consideration of the project would require considerable more detailed surveying, a crude estimate would made it 800,000 linear feet,

which includes the rear canal, at a cost of 15 cents per linear foot, would involve an expenditure of some $12,000.00.

A resume of the probable cost of this project from the best information on the subject, which we believe to be rather under than over estimated would be as follows:

Levee, 1,287,000 cubic yards at 9 cents...	$115,830.00
100 sluices at $75.00 a piece.....	7,500.00
Canal and ditches.....	12,000.00
	$135,330.00

Respectfully submitted,

THE BOARD OF STATE ENGINEERS,

Per SIDNEY F. LEWIS,

Assistant State Engineer.

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REPORT

OF THE

Board of State Engineers

OF THE

STATE OF LOUISIANA

TO

HIS EXCELLENCY, WILLIAM WRIGHT HEARD,

GOVERNOR OF LOUISIANA,

FROM

APRIL 21, 1902, to APRIL 20, 1904.

BATON ROUGE.
THE ADVOCATE, OFFICIAL JOURNAL OF THE STATE OF LOUISIANA.
1904.

Board of State Engineers

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332715

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OFFICE BOARD OF STATE ENGINEERS.
STATE OF LOUISIANA,
NEW ORLEANS, LA., April 20, 1904.

To His Excellency, W. W. Heard, Governor of Louisiana.

SIR: The Board of State Engineers has the honor to submit for your Excellency's information the following report, with accompanying appendices, covering the period from April 21, 1902, to April 20, 1904.

DUTIES AND PERSONNEL OF THE BOARD.

The Board of State Engineers was created by Act 33, approved February 10, 1879. The duties of the Board, as defined by this Act, are to make surveys of water courses, public works and levees of the State; to "report to the Governor of the State the improvements necessary and the levees to be constructed, which are of prime importance to the State at large;" to furnish estimates and specifications of the work so required; to examine and measure the work recommended by the Board and done under contracts made by the State, and to certify the amount of payments due for work thus executed.

Under the provisions of later laws the Board has been made, in general terms, the engineers and advisers of fourteen out of the fifteen Boards of Levee Commissioners now organized in the State, viz:

1. The Fifth Louisiana Levee District, by Act 44 of 1886.
2. The Tensas Basin Levee District, by Act 59 of 1886.
3. The Red River, Atchafalaya and Bayou Bœuf Levee District, by Act 79 of 1890.
4. The Pontchartrain Levee District, by Act 95 of 1890.
5. The Atchafalaya Basin Levee District, by Act 97 of 1890.
6. The Lafourche Basin Levee District, by Act 13 of 1892.
7. The Lake Borgne Basin Levee District, by Act 14 of 1892.
8. The Caddo Levee District, by Act 74 of 1892.

332745

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7. The Lake Borgne Basin Levee District, by Act 14 of 1892.
8. The Caddo Levee District, by Act 74 of 1892.

9. The Bossier Levee District, by Act 89 of 1892.
10. The Buras Levee District, by Act 18 of 1894.
11. The Cat Island Levee District, by Act 110 of 1894.
12. The Grand Prairie Levee District, by Act 24 of 1898.
13. The Plaquemines Parish East Bank Levee District, by Act 7 of 1902.
14. The Courtableau Levee District, by Act 166 of 1902.

The Orleans Levee District was created by Act 93 of 1890; but under the provisions of Act 79 of 1892, the only duty of the Board of State Engineers is to approve or disapprove the "location, construction and repairs of all levees on the river front of said District."

Act 144 of 1888, makes it the duty of the Board "to furnish such lines and levels, plans and estimates as may be considered necessary for the proper and efficient execution of the work" to be done by the Board of Control of the New Basin Canal.

Article 294 of the Constitution of 1898, directs that the Board, "whenever called on so to do, shall furnish the different road districts with plans and specifications for public roads, and such assistance and advice as will tend to create a uniform system of public roads throughout the State;" and under Article 239 it devolves upon the Board, in certain cases, to give to or withhold from the Boards of Commissioners of the several levee districts of the State, authority to contract with or permit steam railroad corporations to construct, maintain and operate railroad tracks upon the public levees.

Acts 123, 124 and 171 of 1902, require the Board—when directed by the Governor—to make surveys, subdivisions and plats of certain unsurveyed lands belonging to the State.

The Board has been called upon by the joint organization of the Atchafalaya Basin and Lafourche Basin Levee Boards, provided for under Act 9 of 1900, to make the elaborate surveys, with plans, specifications, etc., necessary for the lock and temporary dam, and the improved channel in Bayou Lafourche, as authorized or required by this Act and by Act 84 of 1902; and also by other Levee Boards to continue examinations and surveys for a number of extensive drainage works proposed or undertaken by them.

The performance of these duties has required the constant care and attention of the members of the Board during the past two years, and has required the regular employment of three or four surveyors and rodmen as assistants in the field, as well as

the temporary services of other employes both in the field and in the office.

The increasing amount of engineering work necessary for the examinations, surveys, estimates, plans and reports requisite for prosecuting the numerous works executed or projected by the various levee districts, and the additional duties devolving upon the Board by new undertakings authorized or provided for at each successive session of the Legislature, has largely augmented the expenses as well as the care and labor involved. The appropriations made for the necessary mileage, assistance and expenses of the Board of State Engineers have, hence, become insufficient to fully meet the increased demands for surveys and office work. For the efficient performance of the duties now demanded from the Board it is necessary that a larger sum than heretofore be appropriated from the General Engineer Fund for carrying on the engineering work of the levee districts, and for transportation, employment of assistants, hire of labor and other necessary expenses.

During the period covered by this report the several members of the Board of State Engineers have given their attention, as heretofore, to the affairs of all the levee districts, and to duties in any of them as the occasion required. As a matter of convenience, however, the engineering work in the Pontchartrain, the Lafourche Basin, the Lake Borgne Basin, the Buras, the Grand Prairie and the Plaquemines Parish East Bank Levee Districts, has received the special attention of Assistant State Engineer Lewis. Assistant State Engineer Perrilliat has performed the duties required for the work of the Atchafalaya Basin Levee District, and has attended to most of the work called for by the Board of Control of the New Basin Canal and Shell Road and by the joint Atchafalaya and Lafourche Levee Boards for the improvement of Bayou Lafourche. Assistant State Engineer Robertson has given special attention to the work in the Fifth Louisiana Levee District and to that of the Tensas Basin Levee District in Arkansas; and Assistant State Engineer Kerr has attended to the work in the Caddo, the Bossier, and the Red River, Atchafalaya and Bayou Bœuf Levee Districts.

Chief State Engineer Henry B. Richardson having been appointed a member of the United States Mississippi River Commission, resigned, on March 31, 1904. On April 7th following, Frank M. Kerr was appointed Chief State Engineer, and Gervais Lombard, Assistant State Engineer.

Levee Work of the Past Two Years.

The work of improving the public levees in Louisiana and of those directly protecting Louisiana in the lower counties of Arkansas has been continued during the period since our last biennial report by the several levee districts, by the State, and by the United States.

The total amount of this work done between April 21, 1902, and April 20, 1904, by the United States, the State, and the Levee Districts, is shown in the following table:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the Levee Districts	50.67	87.77	7,906,333	$1,647,978.36
By the State of Louisiana	25.13	36.59	2,637,369	449,620.15
By the United States	6.22	54.98	3,535,701	580,433.50
Aggregates	82.02	179.34	14,079,403	$2,678,032.01

As regards locality, the work may be divided as follows:

LOCALITY	Miles of New Levee built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
IN ARKANSAS				
On the Mississippi River	2.92	14.41	1,131,164	$ 245,780.36
IN LOUISIANA				
On the Mississippi River	41.61	144.26	9,823,564	1,892,077.77
On the Red River	22.94	10.86	2,097,966	355,549.16
On the Atchafalaya River	7.59	3.94	677,518	133,441.31
On Bayou Rapides		0.13	3,331	1,594.08
On Bayou des Glaizes	0.08	3.40	76,395	12,315.66
On Bayou Lafourche	0.13	2.34	96,320	21,256.83
On the Gulf Coast	6.75		173,155	16,016.84
Aggregates	82.02	179.34	14,079,403	$2,678,032.01

The foregoing tables do not include the extensive drainage work done during this period by the Red River, Atchafalaya and Bayou Bœuf Levee District, costing about $107,000, of which class of work there still remains, under the original project and estimates, some $82,000 worth of work to be done. Nor do they

include the work for the improvement of Bayou Lafourche, by a lock, dam and other channel improvements, which have been under taken by the Atchafalaya Basin and Lafourche Levee Districts, on which some $54,000 were expended during the same period, leaving some $371,000 to complete the project.

There remains, in addition to the above, under contracts of the State and the several levee districts now in course of execution, a large amount of levee work still to be done, estimated to require about 1,700,000 cubic yards of earthwork, and to cost about $200,000.

A considerable amount of work was also done and expenditures incurred, by the levee districts and by the United States, for protection work during high water, for weed cutting, minor repairs, auxiliary work of various descriptions, and for wooden revetments, for which the information is not in all particulars at hand to base a positive statement, but which must aggregate a considerable sum.

Details relative to the location, character, extent and cost of the levee work of the past two years will be found in the paragraphs of this report headed the "Levee Districts," and in tabular form in Appendix A.

The Levee System.

The system directly protecting Louisiana includes not only the public levees within the State, but also those in Arkansas south of the Arkansas River. Levees have been built by the State of Louisiana and its several levee districts at one time or another on the Mississippi, Red, Ouachita, Black, Little, Tensas and Atchafalaya Rivers, and on Bayous Rapides, des Glaizes, Bon Idee, Courtableau and Lafourche, within the State; and in Arkansas, on the Mississippi and Arkansas Rivers, and on Cypress Creek and Amos Bayou. But since the great improvement of levees made within the last twenty years on the Mississippi River above the mouth of Red River, those on the Black and Ouachita and their tributaries, have become of minor importance, because of the more complete exclusion from their basins of overflow from the Mississippi.

Levee work for a number of years past has, therefore, been principally applied on the Mississippi, Red and Atchafalaya Rivers, and on Cypress Creek, Bayou des Glaizes and Bayou Lafourche. The recent closure of Bayou Lafourche, at its head, by a temporary

dam, pending the construction of a lock, will render the maintenance of a levee system, some hundred and sixty miles in length on that stream, unnecessary hereafter.

At present the principal lines of continuous levee protecting the alluvial lands of Louisiana against overflow, are as follows:

1. From the highlands near Pine Bluff, Ark., down the right bank of the Arkansas River to within about eight miles of its mouth. The lower half of this line has been greatly improved within the past few years, about fifteen miles of it, below Red Fork, having been built and maintained by the United States.

2. From Costello's Gin, a point on Amos Bayou—about five miles south of Red Fork and about twelve miles west of the mouth of the Arkansas—a continuous line of levee extends down the left bank of Amos Bayou about five miles; thence—crossing Boggy Bayou—to the right bank of Cypress Creek about 1.5 miles; thence about six miles down the right bank of Cypress Creek to Lucca Landing, on the Mississippi River, where it joins the levee system on the right bank of the Mississippi; and thence continuing down through Desha and Chicot Counties, Ark., and the Fifth Louisiana Levee District to near Bougere Landing, in Concordia Parish, about 295 miles below Lucca Landing; thus making one unbroken line from Costello's Gin, Ark., to Bougere Landing, La., about 307.5 miles in length. Immediately below the latter point there is a gap in the levee line, known as Bougere Crevasse, and below this about 8.5 miles of new levee, bringing the end of the present levee system to within about 11 miles of the mouth of Red River.

3. From Torras Landing at the mouth of Red River (or more properly the mouth of Old River) the levee extends down the right bank of the Mississippi without break or interruption to the outlet known as the Jump; that is, to within about 10 miles of the Head of the Passes, a length of about 288.1 miles.

And from the same point at Torras Landing, the levee line runs along the south bank of Old River 7 miles to Barbres Landing; and thence down the left bank of the Atchafalaya River to and across Sherman's Bayou, a length of about 41.9 miles. These lines thus form a continuous system on the Atchafalaya, Old and Mississippi Rivers, 337.0 miles in length.

4. On the left bank of the Mississippi River the levee line extends uninterruptedly from Baton Rouge to what is known as the New Canal, about 5 miles below Fort St. Philip, a length of about 215.5 miles.

5. The upper levee system of the Caddo Levee District on the right bank of Red River, extends from Blanton Bluff, Ark., about 1.5 miles above the Louisiana line to Gold Point, a length of about 45 miles of levee.

6. The lower levee system of the Caddo Levee District—also on the right bank of Red River—extends from the bluffs, on the north side of Bayou Pierre, to the lower limits of Caddo Parish, a length of about 35 miles of levee.

7. The levees of the Bossier Levee District, on the left bank of Red River, extend from Hurricane Bluff to Dennison Plantation, a length of 58 miles of levee.

8. The upper levee system of the Red River, Atchafalaya and Bayou Bœuf Levee District is continuous from the highlands of Bayou Rapides—about one and a half miles above the mouth of the bayou—down the bayou to its junction with Red River, at Alexandria, about 1.5 miles, and thence down Red River to the Avoyelles Prairies—at David's Ferry—about 35.5 miles in length.

9. The lower system of the Red River, Atchafalaya and Bayou Bœuf Levee District is continuous on the right bank of Bayou des Glaizes from "The Junction," about 9 miles above Moreauville, down the bayou to its junction with the Atchafalaya River, at Simmsport, about 48 miles; and thence down the Atchafalaya River to a point 4 miles below Melville, a length of about 30 miles, making a total of 78 miles of levee.

The aggregate length of the levee lines above described is 1,126.5 miles, 101.3 miles of which are in the State of Arkansas, and the remainder, 1,025.2 miles, in Louisiana. (For tabular statement of length of levee line, see Appendix B.)

The Construction of Levees.

Owing to the higher grade recommended and adopted for levees, and being generally observed in their construction, the number of cubic yards to the running foot is much greater than was previously required.

The new levees, therefore, undertaken steadily involve work of greater magnitude and larger expenditure than heretofore, not only in the increased quantity of earthwork, but in the price per cubic yard. The question of time, too, required for their construction is now a far more serious proposition than in the past, and it is evident that from a standpoint of safety alone and to insure completion within proper limits of time, that new levees should

be undertaken in advance of the time when their immediate need only seems demanded.

In support of this view the Board of State Engineers cannot do better than quote from its last report, as follows:

"It is impossible to predict with certainty the exact time when a levee will be breached by the caving river banks, and this fact has sometimes caused the undertaking of new levees some considerable time before they were actually needed. It is plainly the duty of the authorities in charge to take no unnecessary chances in the premises, and, whenever means can be made available, to begin the construction of these important works in time for them to be completed, if possible, before the existing lines are destroyed by the caving of the banks; for although the old levees do not always cave into the river as soon as may have been expected when the new levees were undertaken, and it may then appear that work has been done before the actual need for it has developed, yet, under the circumstances, there seems to be no other safe course to pursue.

"The increased height of the levees and the consequent addition to the labor and difficulty attending their construction, have shown that the present methods of doing the work should be improved. Levees in many localities are becoming too large and too high to at all times be built to advantage by men with wheelbarrows, or for the best results in economical construction with mules and scrapers. It would seem that the use of power-driven machinery in levee building may be the proper solution of this difficulty. Several attempts have been made in this direction, and although machines have been devised which give satisfactory results under certain conditions, yet up to the present time no system of machinery has been introduced which will meet all cases.

"The Board of State Engineers invites the attention of engineers and contractors interested in earth handling machinery to this field of work, believing that in it will be found a source of profit both for the contractors and the State.

The Levee Districts.

The creation of the Plaquemines Parish East Bank Levee District by Act 7 of 1902, and the Courtableau Levee District by Act 166 of 1902, makes the present number of levee districts in the State fifteen. They all have corporate powers exercised under the administration of boards of commissioners varying in number from three to nine; and all, except the Orleans Levee District, are em-

powered to levy *ad valorem* taxes for levee purposes, not exceeding the constitutional limit of ten mills on the dollar, and to impose local assessments on lands. Most of them have also power to levy assessments upon agricultural products raised within their territory and upon railroads of standard gauge. All of them have authority to issue bonds. The aggregate of district levee bonds now authorized in all the districts, excluding the Cat Island Levee District, is $4,899,000. The total assessed valuation of the same levee districts is $209,029,008.

The Tensas Basin Levee District comprises the Parishes of Morehouse, West Carroll, Richland, Franklin and Catahoula, with those portions of Ouachita and Caldwell Parishes lying east of the Ouachita River. The alluvial lands liable to overflow within this territory are subject to taxation and local assessment for levee purposes. The district is more exposed to overflow by flood waters escaping from the Mississippi and Arkansas Rivers in Arkansas, than from any other source, and its work has always been mostly applied to the construction and improvement of levees in Desha and Chicot Counties, Ark., as is contemplated in the Act (No. 59 of 1886) under which the district was organized.

The United States "Upper Tensas District" includes the same levee line, and the larger part of the levee work done on this line of levees since 1881 has been by the United States.

The Board of Levee Commissioners consists of seven members, one appointed from each Parish or part of Parish in the district.

The assessed valuation on the tax rolls of 1903 was $3,809,852.

The work done by the district during the past two years has been as follows, viz: 4.17 miles of enlargement, aggregating 309,-156 cubic yards of earthwork, at a cost of $96,715.16.

The total amout and cost of levee work done by the United States during the past two years in Desha and Chicot Counties, Arkansas, is as follows: 2.92 miles of new levee, and 10.24 miles of levee enlargement, involving 822,008 cubic yards of earthwork, at a cost of $149,065.20.

The folowing extract from our report of April 21, 1902, describes the levee situation in Desha and Chicot Counties, Arkansas:

"The line of the so-called Opossum Fork levee turns up Amos Bayou and follows it closely to Costello's Gin. This point is, at present, the head of the system. It is not, however, as sometimes supposed, on land above high water, for during such floods as that of 1897 a considerable volume of water flows around the head of

the system and finds its way into Bayou Macon and other streams, and thus into Louisiana.

"It is difficult to obtain the necessary right of way for the extension of this line to a point above overflow, because some of the owners of the land through which it would have to be located object to the extension of the system, and have already thrown obstacles in the way of the maintenance of the present line. Suits have been brought and are understood to be still pending to compel the removal of the levee line along Amos Bayou and to force the opening of Boggy Bayou.

"The district at various times in the past has expended considerable amounts in the maintenance of the levee line on the south bank of the Arkansas River, and a project has been favored by citizens of that section to extend the levees from the lower end of the present system on the Arkansas River to join the existing line on Cypress Creek, at or near Boggy Bayou, and to re-open the latter for drainage.

"This project, if carried out, would have the effect of increasing the length of line upon which the Tensas Basin District directly depends for protection by more than 60 miles, and would make the district subject to overflow from the Arkansas River in the event of a break in the Red Fork or Lincoln County line, as the flood waters of the Arkansas would then be cut off by the proposed levee line from returning into the Mississippi River anywhere above the mouth of Red River.

"The Tensas Basin Levee Board, in aiding the construction and maintenance of levees in Arkansas, is, of course, subject to the laws of that State, the alluvial territory of which forms but a small proportion of the whole, and in which the privileges and authority given by law to the levee districts of this State do not exist. The whole matter of the location of levees and the expropriation of lands for their construction must be met by the Desha and Chicot Levee Districts. The latter comprises the entire county, whereas the former includes only a part of Desha County, in which there are three levee districts, namely, the Laconia, the Red Fork, and the Desha Districts. The Laconia District lies north of the Arkansas River, and hence is not of direct interest to the State of Louisiana. The total revenue of the Red Fork and the Desha Districts is less than $6,000 per annum, while that of the Chicot District is about $8,000. These sums would not go far towards the protection of any threatened point nor pay for the

construction of any extensive new levee, especially where the land thrown out would have to be paid for. These districts, therefore can hardly be depended on to do more than furnish right of way; and so the United States and the Tensas Basin Levee District must probably continue, as heretofore, to supply the larger share of the means for maintaining and improving the levees."

The Fifth Louisiana Levee District is composed of the Parishes of East Carroll, Madison, Tensas and Concordia.

Its assessed valuation on the tax rolls of 1903 was $6,464,219.

It has a frontage on the Mississippi River of 235 miles, and a continuous levee line of 218 miles, covering 207 miles of river front. Below the end of this line of continuous levee—near Bougere Landing—there is an unleveed gap of about 6½ miles, known as the "Bougere Crevasse," and immediately below this gap a line of new levee has just been completed which brings the lower end of the levee system of this district to within about 11 miles of the mouth of Red River.

The levee line of the northern part of the district, above a point oposite Warrenton, Miss., is included in the United States "Upper Tensas District," and the southern part in the United States "Lower Tensas District."

There are eight Levee Commissioners—two appointed from each Parish.

The amount and cost of the work done in the district during the past two years by the district, the State and the United States, is approximately as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the District	7.54	28.89	2,313,912	$ 540,945.25
By the State	10.42	9.53	827,447	123,769.01
By the United States	0.10	19.74	1,214,929	220,953.46
Totals	18.06	58.16	4,356,288	$ 885,667.72

The high water of 1903, at Ashton, near the Louisiana-Arkansas line, at the head of the Fifth Louisiana Levee District, reached a stage of 2:2 feet above that of 1897, which was the highest of previous record, and was rising at the rate of two-tenths of a foot in twenty-four hours when a crevasse occurred, on March 26, 1903, on the Mississippi side, which was at first reported to be

at Swift Water, but was afterwards ascertained to be at La Grange, about 4 miles below Greenville. At Lake Providence, 30 miles below Ashton, the high water of 1903 was 1.9 feet above that of 1897; at Vicksburg, 57 miles below Lake Providence, the highest stage reached in 1903 was 0.7 feet below that of 1897; at St. Joseph, 0.2 feet above that of 1897; at Natchez, 0.6 feet above that of 1897, and at Bougere, 0.3 feet below that of 1897.

The largest crevasse of the year occurred in the Fifth Louisiana Levee District, at Hollybrook, 5 miles below Lake Providence, when the river had already fallen over 2 feet at Lake Providence, and 1¼ feet at Vicksburg. It of course had no influence upon the maximum stage in that locality. This crevasse occurred in a very large and comparatively high-grade levee, and was without premonition to those who had charge in the immediate vicinity. The levee at the point at which the break occurred was 22 feet in height, and had about 18 feet of pressure against it, standing four feet above the water line as it then was.

It will always be a matter of conjecture as to just how this crevasse occurred, since being in appearance one of the best embankments in the district less watchfulness was accorded to it than to the rest of the levee line immediately above and below. It is evident that it occurred from a defect near the water line, as those who first saw it described it as having begun from a leak about the size of one's arm pouring through about 4 feet below the crown. The material of which this levee was composed was a black loam, and the crevasse widened very rapidly. It occurred at 6:30, on the morning of April 3, and by 12 o'clock, by actual measurements, it had become 800 feet wide, and the rate of widening increased at this ratio until the following day it had become 1,600 feet wide and finally reached a width of 3,400 feet, digging a gulch 3,400 feet long, 1,000 feet wide, and 74 feet deep below the surface of the ground across the break. No attempt was made to close this crevasse, as the rate of widening was so rapid as not to justify any steps in this direction.

Exact information as to the area and limits of overflow from this crevasse was not easily obtainable, but attempts were made to gather this information through the local surveyors of the several parishes affected by it, and the following statement is believed to be approximately correct.

The overflow from Hollybrook crevasse covered over two-thirds of the two upper parishes of the district; that is, East Carroll and Madison. In the latter Parish the overflow was confined to the

western part, leaving the cultivated lands on the river front untouched. The course of the water was towards the Tensas River and Bayou Macon, and thence down these streams and through the low wooded lands adjacent, and across them into Franklin and Catahoula Parishes, passing between the highlands of Sicily Island on the west and the banks of the Tensas on the east, and mingling in Black River some miles below the junction of the Ouachita and the Tensas, with the back water from Red River and Bougere.

The total area of overflow directly due to the Hollybrook crevasse is estimated at 930 square miles, about 46,200 acres (say 72 square miles) of which is cultivable land, in the Fifth Louisiana Levee District.

Owing to the unusual rains in the Mississippi valley, which occurred in the latter part of May in the same year, an alarming stage of the Mississippi was again expected, and immediate steps were taken for the construction of a run-around, to keep out what is known as the June rise.

Mr. McClellan, President of the Fifth Louisiana Levee Board, and Assistant State Engineer Robertson of the Board of State Engineers, hurried to the scene, and after making a careful reconnaissance of the situation, concluded to do what was possible for the construction of this run-around. The long stretch of islands, lying directly in front of Hollybrook, which was at one time a rapidly caving bank, has caused very little deposit to settle on the banks, and this point is extremely low, overflowing at 31.2 feet on the Lake Providence gauge, at the lowest point; and the line upon which the location was made was four feet lower than the crest of the bank.

The water, therefore, had ceased to flow through the Hollybrook crevasse, but ten days from the spring rise, before the water began to reach such a stage, from the June rise, as to flow through again. It was, therefore, seriously considered whether it were better to make a fight on a protection line, or on the line located for the permanent levee, but as the time was not sufficient for the construction of any work on the permanent line, a desperate attempt was made on the bank of the river in front of Hollybrook.

The shortest line that could be had at this point was 145 stations, or very nearly three miles in length. The intow of the current and the heavily wooded banks had caused much drift of all descriptions to settle on the front where the location was to be. A large force was immediately put to work and succeeded in clearing the drift and the smaller timber from the line. A line of levee

145 stations in length and averaging in height about six feet, with slopes of 1½ to 1 and 4 foot crown was constructed on this line between June 4 and 14. At first the task was considered hopeless, but the great interest behind this levee justified the attempt. It was considered at the time this protection levee was begun that the highest stage reached at Lake Providence would not exceed 35 feet, but the stage at the time the protection levee was overtopped was 36.2 on June 15. It ultimately reached 38 feet.

In the attempt to hold this levee, more than 300 wheel-scrapers and teams were used, and 830 men, the cost exceeding $20,000 to the district. The effect of this second break was to overflow practically the same area as that overflowed by the crevasse in April.

Immediately upon the recession of the water in June a survey was made and a contract let for the construction of a new levee around the Hollybrook break, which was completed on January 1, 1904. This levee has a grade three feet above the highest water and contained approximately 400,000 cubic yards.

In our report of April 21, 1902, it was stated that, "The Texas and Pacific Railway Company in extending its line of railroad up the west bank of the Mississippi river, now has under construction an embankment through the Bougere swamp. A portion of this embankment is built to a height about the same as that of the high water plane of 1897; though it has neither the width nor the area of cross section usually prescribed for a levee of the same height, nor has it been built with such care as regards the preparation of the ground on which it stands and the exclusion of improper materials from its composition, as is now generally thought necessary for security.

"At the same time it is probable that this embankment might serve as a levee against such moderate floods as have occurred in at least six out of the past ten years, and it might be possible to enlarge and strengthen it some time in the future, if means become available, and make it as secure as any other line of levee.

"It has, therefore, been decided by the Fifth Louisiana Levee District, upon the recommendation of this Board, to undertake the construction of a new levee from a point about half a mile above Bougere landing to join this railroad embankment near Boggy bayou; and the president of the Board has been authorized to advertise for proposals to this and for the construction of about 300,000 cubic yards of new levee."

* * * * * * *

"It is not to be expected that the extension of the levee line on the front of the Mississippi river, even as far as the mouth of Red river, with that tributary remaining unclosed, would absolutely protect the back lands of Concordia and Catahoula parishes against high water from the Mississippi. This end could only be obtained if Old River were diked and entirely divorced from the Mississippi."

The levee line was extended as proposed, and joined to the railroad embankment, which was so far completed before the flood of 1903 as to have a track laid on it for construction trains, though lacking in some places two feet or more of its designed grade.

The railroad bank thus served the purpose of a levee only until the river rose to within about three and a half feet of the highest stage reached in 1897, when it broke on March 14, 1903. The break rapidly widened, so that on the decline of the flood about three miles of the railroad bank had been washed away, as well as about 1.8 miles of new levee just completed by the district.

The importance of the permanent closure of this gap to the lower part of the Fifth Louisana Levee District cannot be overestimated.

Although the stage of water in Red river, just previous to the time that the railroad embankment succumbed, was very high, it was, nevertheless, seven feet lower than that in the Mississippi river, on the opposite side, and thus, up to that time, the tillable lands in Concordia parish, situated next to the Mississippi river front, above the Bougere crevasse, were free from back water. However, as a result of the failure of this railroad embankment to withstand the flood, and the consequent washing away of the levee line adjoining it above, more than 80 per cent. of the area of the parish was inundated. No similar effect to that part of the Fifth Louisiana Levee District would result from any single crevasse occurring in the line of levee above in East Carroll or Madison parishes, as was formerly the experience.

The waters of the Hollybrook crevasse of 1903, thirty-five miles below the state line, followed a route to the west of the Tensas river, between that stream and Sicily island, and did not to any appreciable extent affect the inflow of water at Bougere.

The Atchafalaya Basin Levee District is composed of the entire parishes of Pointe Coupee, West Baton Rouge and Terrebonne, and of parts of the parishes of Iberville, Ascension, Assumption, Lafourche, St. Martin, St. Mary and Iberia.

Its assessed valuation on the tax rolls of 1903 was $13,564,881.

It has a frontage of 121 miles on the Mississippi river, extending from Torras to Donaldsonville; of 7 miles on Old river, extending from Torras to Barbres landing, and is bounded on the west by the Atchafalaya river, 11 miles of which stream is leveed. It has 121.1 miles of levee line on the Mississippi river, 7 miles on Old river, and 11.9 miles on the Atchafalaya river. It still has 80 miles of levee line on Bayou Lafourche, which, under the terms of Act 84 of the Legislative session of 1902, must not be disturbed; but since December 10, 1903, Bayou Lafourche has been divorced from the Mississippi river by the construction of an earth dam at Donaldsonville, and therefore Bayou Lafourche is no longer directly subject to the fluctuations which rendered a levee line necessary along its banks.

The Board of Commissioners governing the district is composed of seven members, three of whom are appointed from the Mississippi river parishes, three from the interior parishes, and one at large on the recommendation of the railroads of the district.

The domicile of the Board is at Port Allen, West Baton Rouge Parish, La.

During the last two years the levee work done by the levee district, and by the state, has been mostly confined to the Mississippi and Atchafalaya rivers. That done by the United States government has been entirely on the Mississippi river. On the Mississippi river, the Solitude new levee, previously undertaken, has been completed, the Palo Alto, Taylor, Irvine and Chapman new levees were built, and the Eliza, Lefeivre and Texas new levees were undertaken. The construction of these new levees was rendered necessary by the caving of the banks at these points, and they aggregate [illegible] miles in length. In addition to this 20.1 miles of levee were raised and enlarged to Commission grade and standard section. The Commission grade is [illegible] feet above the high water of 18[illegible] at Torras, and [illegible] feet above the same plane at Donaldsonville. The standard section adopted within this district has a [illegible] feet [illegible] slopes of three horizontal to one vertical, [illegible] less than 15 feet [illegible] W[illegible] 15 feet [illegible] a slope of [illegible]

O[illegible] the con-[illegible] four [illegible] M[illegible] a mile [illegible] 12 [illegible] below

Melville. Although no standard grade has yet been adopted for the extension of the levee system on this stream, the line has been built nowhere less than three feet above the highest water of the past, and near the lower end of the line nearly five feet above the highest water of the past in anticipation of the probable increase in flood height which will occur in the future owing to the further confinement of the waters of the Atchafalaya river resulting from the extension of the levee line.

The following table gives the length and contents in cubic yards of the work done in the Atchafalaya Basin Levee District during the last two years:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
ON THE MISSISSIPPI RIVER.				
By the District	2.52	12.30	1,057,873	$ 222,482.22
By the State	0.72	4.97	325,960	52,263.77
By the United States	0.48	1.76	141,594	21,542.94
Totals	3.72	19.03	1,525,427	$ 296,288.93
ON THE ATCHAFALAYA RIVER.				
By the District	6.68	0.31	455,039	$ 86,715.41
ON BAYOU LAFOURCHE.				
By the District	0.13	0.70	31,785	$ 5,375.65
RECAPITULATION THROUGHOUT THE DISTRICT.				
By the District	9.33	13.31	1,544,697	$ 314,573.28
By the State	0.72	4.97	325,960	52,263.77
By the United States	0.48	1.76	141,594	21,542.94
Grand Totals	10.53	20.04	2,012,251	$ 388,379.99

The high water of 1903 brought a severe strain on the levees of the Atchafalaya Basin Levee District, yet, owing to their improved condition they were, at no time, in danger and were amply sufficient to take care of the flood of that year. In many places softness of the slopes, and leaks became apparent during the passage of the flood, but at no time did these cause any anxiety nor were they beyond control of the ordinary remedies applied in such cases.

The flood of 1903 was 0.2 ft. below the highest water of the past (1897) at Torras, 0.7 ft. below the highest water (1897) at Baton Rouge, and 0.6 ft. below the highest water (1897) at Donaldsonville.

On Bayou Lafourche, however, the flood of 1903 assumed most dangerous proportions. Owing to the peculiar physical conditions governing that stream, which have been described at length in previous reports of this Board, the high water plane assumed record-breaking heights along the lower reaches of the bayou long before the high water mark had been reached in the Mississippi river. This abnormal flood height occasioned three crevasses on the right bank of Bayou Lafourche, two occurring on March 8th; the first at Falgout, 8½ miles below Lockport, and the second at Guidry, 9½ miles below Lockport. These crevasses were caused by the overtopping of the levee, due to the excessive height of the flood. The third crevasse occurred at Howell's, about 2½ miles above the town of Thibodeaux, on March 2nd, and although the cause of this crevasse was never definitely ascertained it is thought to have been due to the scant section of the levee at that point. It is worthy of note that on March 8th, the date of the first two crevasses, the water at Donaldsonville, the head of Bayou Lafourche, read 27.8 on the gauge, which is 5 feet below the high water mark at that point, and that on March 22d, the date of the Howell crevasse, the Donaldsonville gauge read 30.9 feet, which is 1.9 feet below the high water mark at that point.

The Cat Island Levee District, in the Parish of West Feliciana, was created by Act 110 of 1894. It comprises the territory on the east bank of the Mississippi river from Ratcliff's landing to Bayou Sara. The act provided for the appointment of five levee commissioners, and authorized the issuance of bonds to the amount of $100,000.

As stated in previous reports, surveys have shown that the cost of levees necessary for the protection of this district would be excessive as compared with the probable revenues, and that even after building an effective levee system, the drainage of the district during prolonged seasons of high water, could only be maintained by the operation of costly pumping machinery. Under these circumstances no action has ever been taken by the commissioners for raising funds or for undertaking levee work. The act under which the district was created has never been repealed; and it still remains, as heretofore, a levee district only in name.

The Pontchartrain Levee District comprises the alluvial lands on the east bank of the Mississippi river between the cities of Baton Rouge and New Orleans, consisting of parts of the parishes of East Baton Rouge, Iberville, Ascension, St. James, St. John, St. Charles and Jefferson. Its situation is so favorable as to make it dependent for protection solely upon the integrity of its 126 miles of levee on the Mississippi river front.

The assessed valuation of the district, on the tax rolls of 1903, was $8,083,285.

There are nine commissioners, one from each parish in the district, and one representative, respectively, of the Illinois Central Railroad Company and of the Louisville, New Orleans and Texas Railway Company.

The domicile of the Board is at Convent, St. James parish, La.

The amount and cost of the work done in the district during the past two years by the district, the state and the United States, is approximately as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the District	2.30	19.11	794,586	$ 150,808.05
By the State	1.16	.....	269,139	49,790.71
By the United States	0.71	17.88	1,044,359	140,288.95
Totals	4.17	36.99	2,108,084	$ 340,887.71

In addition to the above the district has expended $6,687,16 on minor repairs to its levees, such as keeping the line free from weeds, cutting out crawfish and musk rat holes, construction of revetments, and the cleaning of drain ditches.

At Baton Rouge, the upper end of the district, the high water of 1903 was six tenths of a foot lower than that of 1897, while at Carrollton, the lower end of the district, it was two-tenths higher than that of 1897, the high water of 1897 being the highest of previous record at both places.

In view of the above condition, some 21.62 miles of the 126 miles of the levee line, which stood less than a foot above the high water of 1897, were raised. This was done with a small bank of earth from a foot to two feet in height placed on the water side of the crown of the levee and protected by one or two lines of inch

plank at a cost of about $20,000, which expense was partly incurred by the United States government and partly by the district.

When the river gauge at New Orleans read over 19 feet, with every indication of a flood as high if not higher, throughout the district, than that of 1897, through the courtesy of the Illinois Central Railroad Company a patrol train was, on March 18th, tendered to the President of the Board to facilitate rapid delivery of material to the levees at points of threatened danger. This train remained in service from March 18th to April 28th, and proved a valuable factor on several occasions in preventing disaster to the levees of the district. In addition to this train, the executive officer of the United States government stationed boats loaded with material at convenient intervals along the line of levees, which could be easily and promptly moved to any point where needed. The planters also willingly gave assistance and aid whenever called upon by the proper authorities.

The high water protection work of 1903 cost the district $30,928.66, which sum includes the expenses defrayed by the district in the raising of 21.62 mile of levee just previous to the flood.

The Lafourche Basin Levee District comprises all of the alluvial lands, except the Parish of Orleans, lying between Bayou Lafourche, the Mississippi river and the Gulf of Mexico, namely: parts of the parishes of Ascension, St. James, St. John, St. Charles, Jefferson, Plaquemines (to the lower line of Rieland plantation), Assumption and Lafourche (as far down as the lower limits of "Chere Ane Canal"), requiring a levee line of 121 miles fronting the Mississippi river and 70 miles on the Lafourche.

The assessed valuation of the district, on the tax rolls of 1903, was $10,847,000.

There are nine Commissioners—one from each parish in the district, and one from the district at large, appointed upon the recommendation of the railroads of the district.

The domicile of the Board is at Gretna, Parish of Jefferson, La.

The account and cost of the work done in the district during the last two years by the district, the state and the United States, is as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the District	4.23	10.94	957,170	$ 195,524.01
By the State	0.47	5.02	143,394	39,525.39
By the United States	.....	4.29	185,631	28,191.05
Totals	4.70	20.25	1,286,195	$ 263,240.45

In addition to the above the district has expended $34,094.89 on minor repairs to its levees, such as keeping the line free from weeds, cutting out crawfish and muskrat holes, construction of wooden revetments and the cleaning of drain ditches.

At Donaldsonville, the upper end of the district, the high water of 1903 was six-tenths lower than the highest previous water of 1897; at Gretna it was about eight-tenths of a foot higher than in 1897, and at Riceland, the lower end of the district, it was about 1.4 feet higher than in 1897.

There were two crevasses in the levees in this district, one in the Hymelia levee, near the upper end of the parish of St. Charles, and one in the Magnolia levee in the parish of Plaquemines.

The Hymelia crevasse had its origin in a hole at the base of the levee, discovered late at night on March 26th, 1903. This levee was built out on a batture formation in 1891 to supplant an old leaky and defective levee. It was enlarged in 1896, and gave no signs of weakness during the high water of 1897, but it is a known fact that when a hole takes place in a sandy or loamy levee it cuts out very rapidly and soon develops into a break. For over a month, strenuous efforts resulting in an outlay of about $130,000, were made to close the crevasse, but, owing to the treacherous character of the material at the bottom, a complete closure could not be effected, although at one time the cribbing had entirely surrounded the break. The final width of the crevasse in the line of levee was about 750 feet, its size and discharge having been greatly reduced by the constant work done in the endeavor to close it, so that the damage accruing was confined to the plantations submerged in the immediate vicinity.

The thirty-five miles of levee in this district situated in Plaquemines parish were subjected to a greater and longer strain from a higher flood in the river than ever known before, but owing to the improved condition of the levee line, and the constant and assiduous

care on the part of the proper authorities during the flood, there was no disaster in this line of levees with the exception of a break that occurred in the levee through the caving of the bank at the upper end of Magnolia plantation on April 5th, 1903, when the water was near its highest stage and close to the top of the levee. This cave took in a part of the land side base of the levee for a length of about 230 feet, so that the water at once ran over the remaining part of the levee some two feet deep, and later on five or six feet deep. But prompt action on the part of the planters, with the co-operation of the Levee Board and the officials of the New Orleans, Fort Jackson & Grand Isle Railroad Company fortunately resulted in the secure closure of the crevasse within the next four days, before any serious damage was caused by overflow. The cost of this work to the Levee Board was about $7,000.

There were no breaks in the levees of this district on Bayou Lafourche during the flood of 1903, although the water rose to excessive heights, at some points, from 25 to 50 miles below its head, the stage reaching at least a foot higher than in 1897.

The Orleans Levee District was created by Act No. 93 of 1890. Under this act the Parish of Orleans was "formed into a public levee district," and a board of nine levee commissioners was provided for, seven being appointed by the Governor of the State, and two (the Mayor and the Commissioner of Public Works of New Orleans), being *ex-officio* members of the Board.

The engineer of the district has kindly furnished us with a tabular statement of the work done by the Board of Commissioners during the past two years under contracts costing $60,208.07 (for which see Appendix A), and with the following information relative to the length and grade of levees, and the cost of maintenance:

"During the past two years, only one new levee has been necessary, that from Adams to Short street in Carrollton. A cave at that point required the Board to fall back. Since the last report, a conference of the Port Commissioners, the Orleans Levee Board and yourselves, was held; and a new standard for the levee along the New Orleans front adopted. The new levee above referred to has been constructed in conformity with this new standard, except as to width of crown, and is considered the strongest levee in the state.

"Of course, no material difference in the length of our levee line has been made, and there is still a length of 13.88 miles of levee on the right bank, and 12.62 miles on the left bank. The rear

protection levees aggregate about 48 miles, making a grand total of about 74½ miles of levee.

"Of the river front levees, two miles are four feet above the high water of 1903, ten miles are three feet above, seven and a half miles are two feet above, one and a half miles are one foot above, two and three quarter miles are level with, and two and three quarter miles are below the high water of 1903.

"Besides the contract work set forth on the accompanying tabulated statement, the day forces have been kept busy making repairs wherever necessary, and while said repairs were individually small, they amount in the aggregate to considerable."

The Lake Borgne Basin Levee District comprises the alluvial lands on the east bank of the Mississippi river below the City of New Orleans, situated in the Parish of St. Bernard, and in that part of the Parish of Plaquemines lying north of the lower line of Bohemia plantation.

Its levee line is forty-eight miles long.

The assessed valuation of the district, on the tax rolls of 1903, was $1,761,728.

There are three Commissioners, one from each parish in the district, and one representative of the New Orleans and Southern Railroad Company.

The amount and cost of the work done in the district during the past two years by the state and the United States, is as follows:

WORK DONE.	Miles of New Levee Built.	Miles of Levee Raised and Enlarged.	Cubic Yards of Earthwork.	COST.
By the State	0.27	2.76	70,903	$12,244 45
By the United States	0.44	1.07	66,427	9,858 56
Totals	0.71	3.83	137,330	$12,103 01

The district has expended $23,370.08 on the construction of wooden revetments, raising and other repair and protection work. The high water protection work of 1903 cost the district $32,363.67.

The high water of 1903 was about eight-tenths higher than the highest previous water (1897) at the upper end of the district, and about 1.4 feet higher at the lower end of the district.

In consequence of the river below New Orleans having reached flood heights before similar stages developed in the upper river,

the 48 miles of levee in this district were subjected to a greater and longer strain than ever known before, but owning to the improved condition of the levee line, and the consequent and assiduous care on the part of the Levee Board, the planters, as well as all interested parties behind these levees, there was no disaster.

The Grand Prairie Levee District comprises the alluvial lands on the east bank of the Mississippi river, contained within the Parish of Plaquemines, from the lower line of Bohemia plantation to the lower line of Baptiste Collette Gap, requiring a levee of 33.30 miles fronting the Mississippi river. There are 29.34 miles of continuous levee extending from the upper boundary of the district to one mile below the settlement of New Canal. Below this, there are small areas, or settlements, which are enclosed by levees and cultivated. The levees along the river front of this district also protect a very large, important and growing oyster culture bordering on the marsh lands in the rear. The tax on the product of this industry is one of the most valuable resources in the district for levee purposes.

The assessed valuation of the district, on the tax rolls of 1903, was $182, 886.

There are five commissioners in the district.

The domicile of the Board is at Pointe-a-la-Hache, Plaquemines Parish, La.

The amount and cost of the work done in the district during the past two years by the district, the state and the United States, is as follows:

WORK DONE	Miles of New Levee Built.	Miles of Levee Raised and Enlarged.	Cubic Yards of Earthwork.	COST.
By the District	2.66	0.14	32,789	$ 3,793.31
By the State	4.46	3.14	109,956	15,019.90
By the United States	1.09	.....	43,633	7,708.55
Totals	8.21	3.28	186,378	$ 26,521.76

In addition to the above the district has expended $8,402.58 on minor repairs to its levees, such as keeping the line free from weeds, cutting out crayfish holes, musk rat holes, construction of wooden revetments and the cleaning of drainage ditches.

The high water of 1903 was from over one foot at the upper end of the district to eight-tenths of a foot at the lower end of the

district higher than that of the highest previous water of 1897.

This district was created by Act No. 24 of 1898. The flood of 1897, previous to its organization, having breached and destroyed the levees in many places, and overflowed the territory to such an extent as to materially affect its resources, it was unable for lack of funds, in the *interim* of the floods of 1897 and 1903, to do more than build, enlarge and repair the levee line on the river front, and that only to a grade of about one to one and one-half feet above the high water plane of 1897, with crown four feet and slopes two and three to one.

The levees were overtopped by the high water of 1903 and had to be raised for over five miles. Besides this they were subjected to an earlier and longer period of high water than any other district in the state, except the Buras Levee District. The high water of 1897 was reached as early as March 5th, and by March 21st it reached its culminating point.

It was found impossible with the means at hand to prevent some of this temporary work from being washed away in places by the waves, caused by the prevailing March winds, and also by the passing of large ocean steamers.

In consequence of this some parts of the line were breached. The aggregate width of crevasses was not more than three-fourths of a mile, and the area overflowed was mostly sea marsh and did not exceed sixteen square miles, about 1600 acres (2½ square miles) of which was tillable land adapted to rice culture, though but little, if any, of it had been prepared for sowing.

The greatest damage resulting from this overflow was to the oyster beds, which had been extensively planted in the bays and lagoons in the rear of the marsh lands.

The Plaquemines Parish East Bank Levee District, created by Act 7 of 1902, consists of "all the territory contained within the Parish of Plaquemines on the left or east bank of the Mississippi river, beginning at the upper line of Harlem plantation and extending to the lower line of H. H. Baker's Ostreka Farm at Old Quarantine Station." It is entirely included within the limits of the Lake Borgne Basin Levee District and the Grand Prairie Levee District; so that all parts of it are also parts of another levee district. In this respect, as well as in having been constituted "for the purpose of protecting the lands of said district from inundation from the waters of the Gulf of Mexico," the Plaquemines Parish East Bank Levee District differs from any of the levee districts of the state previously created.

The Act provides for the appointment of five levee commissioners and authorizes the issuance of bonds to the amount of $135,000; and as amended by Act 116 of 1902, the Board of Levee Commissioners is authorized to "provide for and cause to be made such openings in its levee line as will insure proper and adequate exit for the drainage water, and to provide for such devices at said drainage outlets as the Board may deem necessary to protect the district during storms or high water."

The domicile of the Board is at Pointe-a-la-Hache, Parish of Plaquemines, La.

In order to carry out the provisions of the act, the Board was organized on August 8th, 1902, and on August 23d, 1902, proposals were invited for building about 33 miles of Gulf Coast levee, containing about 1,350,000 cubic yards of earthwork, and divided into three sections as follows:

Section 1 (Harlem to Bohemia), about 12 miles, 500,000 cubic yards.

Section 2 (Bohemia to Harris Canal), about 11 miles, 450,000 cubic yards.

Section 3 (Harris Canal to Old Quarantine), about 10 miles, 400,000 cubic yards.

Also about the same time sealed proposals were invited for the construction and insertion of wooden sluices in the levee at specified intervals, and for the excavation of a drainage ditch in the rear of the fields parallel to said levee, all of which works were contemplated in the project.

The line of levee is located near the edge of the sea marsh, generally parallel with, and from half a mile to about a mile back from the Mississippi river, on ground less than a foot above Gulf level, and subject, therefore, to overflow from high tides as well as river water during the irrigation of the fields for rice culture. In consequence of these conditions the levee necessarily had to be built with a floating dredge.

A contract was entered into on October 16th, 1902, by the Board with Messrs. Dowdle & Windett for the construction of Sections 1, 2, and 3 at 9¼ cents per cubic yard, work to begin December 1, 1902, and completed June 1, 1904.

On October 10, 1902, a contract was entered into with Gustave Favrot, for the supply and placing in position of drainage sluices at prescribed intervals in the line of levee, at $78.00 per sluice, and in February, 1903, a contract was entered into with Chas. G.

Schayot for the excavation of a drainage ditch at $2.50 per 100 feet of ditch.

Considerable delay, on the part of the contractors for the earthwork, has occurred, owing to their misfortune in the loss of two out of three of their newly constructed floating dredges of the Menge patent designed especially for this work. One was sunk in Breton Island Sound in a rough sea whilst towing it around to "Riviere aux Chenes," and another "turned turtle," at its first trial in the Riviere aux Chenes. The third dredge was built on the ground, and began work on Section No. 1 on or about November 13, 1903.

Up to the date of this report there has been placed in position on this work some 173,155 cubic yards of earthwork in Section 1, at a cost to the district of $16,016.84.

No earthwork has been done in Sections 2 and 3. The Board, within the same time has paid for twenty-nine drainage sluices at a cost of $2,262.00, and has excavated 96,235 linear feet of drainage ditch at a cost of $2,405.87.

The Buras Levee District comprises the alluvial lands on the west bank of the Mississippi river "in the Parish of Plaquemines, south of a line drawn from the lower line of Riceland plantation to the limits of Harang Canal on Bayou Lafourche," extending to the Jump, and requiring a levee line of 33.76 miles fronting the Mississippi river.

The assessed valuation of the district, on the tax rolls of 1903, was $439.112.

There are five commissioners in the district.

The domicile of the Board is at Buras, Parish of Plaquemines, La.

The amount and cost of the work done in the district during the past two years by the state and the United States is as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the State.....	1.28	0.97	58,283	$10,216.51
By the United States.....	0.48	.....	17,120	2,824.79
Totals.....	1.76	0.97	75,403	$13,041.30

In addition to this the district has expended for the construction of wooden revetments and other protection work	$10,597
For repair work, weed cutting	6,038
For high water protection work, 1902	457
For high water protection work, 1903	4,857

The high water of 1903 was from over one foot at the upper end of the district to 0.8 of a foot at the lower end of the district higher than that of the highest previous water, 1897, and the levees were subjected to a greater strain than ever before, but owing to the improved condition of the levee line, and the constant and assiduous care on the part of the Levee Board, there was no disaster to the levees in the district.

The Caddo Levee District. All alluvial land, and all lands subject to or that are liable to overflow from the waters of Red river, or its tributaries, or its outlets, situated in the Parish of Caddo, not including such lands as occur within the corporate limits of the City of Shreveport, are embraced within the boundaries of this district.

The assessed valuation of the district, on the tax rolls of 1903, was $1,156.270.

The affairs of the district are conducted by a board of seven commissioners, appointed by the Governor.

The domicile of the board is at Shreveport, La.

The continuous length of public levee upon which the district is now dependent for protection, is as follows:

1. *Above Shreveport*—From Blanton's Bluff, Ark., to Gold Point, La., 45 miles. The length of river front between these limits, however, is about 54 miles.

2. *Below Shreveport*—From the bluffs on the north bank of Bayou Pierre to the lower line of Caddo parish, about 35 miles, with a length of river front within these limits of about 52 miles.

Owing to the closure of Tones Bayou, the nine miles of levee on Bayou Pierre upon which that part of the district lying below Tones Bayou was formerly largely dependent for protection, is not herein included in the 35 miles now regarded as constituting the main public levee line in the lower Caddo system.

The length of the unleveed part of the district, extending from Eric's Point to Shreveport, referred to in the last biennial report of the Board of State Engineers, has been reduced from 21 miles by river at that time, to about 17 miles by river at the present time, by the extension of the line from Eric's Point to Gold Point

The levee work done in the district during the past two years is as follows:

By the District—New levee, 10.50 miles; enlargement, 3.56 miles, amounting to 831,773 cubic yards, costing $132,077.66.

By the State—New levee, 2.72 miles; enlargement, 0.02 miles, amounting to 213,025 cubic yards, costing $40,994.71.

This represents a total of 13.22 miles of new levee, and 3.58 miles of enlargement, and 1,044,798 cubic yards of earthwork, costing $173,072.37.

All of this work has been completed.

The district also expended a considerable sum, in protection and emergency work rendered necessary during high water, in weed cutting, etc., and in ordinary repair work not measurable in cubic yards.

The general condition of the lines of public levee in the Caddo Levee District is good, though complaint has still to be recorded of abuses to which it is subjected here and there.

The district was, during the period covered by this report, visited by two high waters of considerable proportions, following one another at a short interval. The first culminated at Shreveport on December 16, 1902, its stage on that date reading 34.1, and reaching on many stretches of the river, in the district, stages of from one foot to two and a half feet above any waters of previous record.

The second flood, culminating at Shreveport on March 23, 1903, at a stage there but one foot lower than that of the first flood, failed to develop stages at other points as high comparatively as those developed on the first flood.

Notwithstanding these high stages of water in Red river, the duration of which was longer than usual, the levee lines in the Caddo Levee District proved equal to the service devolving upon them, except at Thompson's, about 50 miles above Shreveport. Here a serious breach in the line occurred on the first flood which remained open during both floods, but has since been substantially closed.

The grade of the levees in the Caddo Levee District was found materially deficient during the first flood in only four localities; at the head of Simpson's Lake, a government levee, due to the excessive shrinkage and settlement; at Hurrican Bluff plantation, built by riparian owners, to smaller dimensions than those prescribed for district and state levees; and at Ashwood and Pascagoula plantations, built by the district in the early days of its existence, before

means were available for building the levees to the more ample proportions now observed.

The levees at all of the localities above described have been raised and enlarged to compare favorably with the balance of the line.

Except for caving banks, both floods would have passed down Red river without serious cause for apprehension to any one in the Caddo Levee District.

Owing to the rapid enlargement of the section of Red river, along the front of the Caddo Levee District, resulting from the more successful confinement of its waters to the main stream, by means of levees, than in its past history, the natural tortuousness of the stream, opposing numerous concave bends to the energy of the current, and the serious disturbance of its regimen by a number of cut-offs which occurred during the high water, notably in the vicinity of Pandora, Hogs Skin Point, Magnolia, and Lovely Point, caving banks have been even more general and serious on this part of Red river within the last year than those usually following the ordinary course of events.

So serious and rapid was the caving at White Hall, Campo Bello and Cross Keys, during the high water described, that the existing levees there, though considered at a safe distance from the river bank, previous to high water (at White Hall, the distance was about 400 feet), were breached, and a general and disastrous overflow in the lower part of the district averted only by the strenuous and successful efforts of the levee authorities, riparian proprietors, and others, in constructing and maintaining in the face of the rising waters a series of extensive run-rounds.

To caving banks is, therefore, due the large amount of levee work shown to have been required in new levees in the district within the period covered by this report. The same influences must necessarily continue for an indefinite period, and will call for further considerable provision for new levees from time to time.

Attention is called to certain special reports to the Board of Commissioners of the Caddo Levee District, appearing in the Appendix B.

The Bossier Levee District. All alluvial lands subject to or liable to overflow from the waters of Red river or its tributaries or outlets, in the Parish of Bossier, south of the line dividing the north half from the south half of township 20 north, are embraced within the boundaries of this district.

The assessed valuation of the district, on the tax rolls of 1903, was $1,428,223.

The affairs of the district are conducted by a board of seven commissioners appointed by the Governor.

The public levee line protecting the district extends at this time continuously from its upper limits, at the foot of Hurricane Bluff to the Dennison plantation, within 5 miles, by river, of the lower limits of the district, a length of line aggregating about 58 miles, the length of the river front, between the same limits, being about 79 miles.

Along the unleveed distance, at the lower end of the district, the banks of Red river are somewhat higher than most of the high waters which have visited the river in the past, and the district has wisely deferred the extension of its system over it until the more urgent work above would justly permit.

Two outlets, however, of considerable proportions, depart from Red river in this stretch,Ninock bayou and Swift Chute bayou, and at times permitted the river to back up through them on to considerable valuable territory at the lower end of the district, against which considerable complaint has locally been made since the last high water in Red river.

To comply with the wishes of the community affected, and remedy the evil complained of, the Board of Commissioners have recently let out contracts to close these bayous, but will defer connecting the embankment closing them, and these with the general system above, until the necessity for it is more fully demonstrated.

The levee work done in the district during the past two years, is as follows:

By the District—New levee, 6.17 miles, amounting to 498,425 cubic yards, costing $87,733.80.

By the State—New levee, 3.55 miles; enlargement, 1.00 miles, amounting to 392,734 cubic yards, costing $61,813.95.

This represents a total of 9.72 miles of new levee, and 10.04 miles of enlargement, and 890,799 cubic yards of earthwork, costing $149,547.75.

All this work, with the exception of that at Swift Chute bayou, has been completed.

The district has also expended a considerable sum in protection and emergency work rendered necessary during high water, in

weed cutting, etc., and in repair work not measurable in cubic yards.

Except for some wear, here and there, and certain abuses to which they continue, from time to time, to be subjected in localities, the condition of the lines of public levees in the Bossier Levee District is good.

As the Bossier Levee District front occupies, within its upper and lower limits, the east bank of Red river, directly opposite the Caddo Levee District, the recital of the high water experiences of the one, during 1902 and 1903, must necesarily be but a repetition of that of the other as already given.

The grade of the entire line of levees in this district stood well above the two floods already described, except in one locality, at Ash Point, about 23 miles below Shreveport, by river. Here a short stretch of topping was found necessary. A new levee extending from Phillip's to Mercer's covering this low stretch, as well as the caving bank extending along it, has since been completed by the district.

The same causes which precipitated so much caving in so many of the concave bends of the river, on the Caddo Levee District side, were also at work on the Bossier Levee District side of the river, and at Willow Chute, Gold Dust, Hopewell, Christiana and Buckhorn, the lines of levee were breached in spots, almost from day to day, by caving banks, during the highest stages reached by the river. Extensive run-rounds, however, were hastily thrown up at these places, from time to time, to cover the breaches as the exigencies arose, and by almost superhuman efforts put forth by the levee authorities, the riparian proprietors, the Shreveport and Red River Valley Railway Company and others, both floods were controlled throughout the length of the district and carried pass it without overflow or material damage.

New lines of levee have, during the past season, been constructed by the district, or the state, at all the places named, as well as at several others where caving banks threatened to encroach upon the existing lines, and the line as a whole is at this time again in a comparatively safe and assuring condition.

Attention is called to certain special reports to the Board of Commissioners of the Bossier Levee District, appearing, in Appendix B.

The Red River, Atchafalaya and Bayou Boeuf Levee District. All lands subject to overflow in the parishes of Rapides and Avoyelles, and that part of the parish of St. Landry situated between

the Atchafalaya river on the east, and Bayou Bœuf and Courtableau on the west and south, are subject to the operations of the original act of incorporation of this district.

All that section of Rapides parish above Alexandria, bounded by bayous Rapides, Jean de Jean, and Red River, and all parts of the parish situated on the left bank of Red River, also all portions of the parish of Avóyelles situated on the left bank of Red River, as well as that part of the parish bounded by Bayou des Glaizes, the Atchafalaya and Red Rivers, and the public road running from David's Ferry on Red river to Bayou des Glaizes, by way of Marksville, Mansura and the "Long Bridge," at Bout du Bayou, have been exempted from the operations of the original act of incorporation of the district.

The assessed valuation of the district, as now constituted, on the tax rolls of 1903, was $4,222,905.

The affairs of the district are administered by a Board of three Commissioners, appointed by the Governor, one from each of the parishes composing the district.

The work done in the district during the past two years is as follows: By the District—Levee Work: New Levee, 0.91 miles; enlargement, 4.26 miles; amounting to 237,676 cubic yards; costing $49,582.93. Drainage Work: Clearing, 22.54 miles, costing $25,559.20; excavation, 30.01 miles, amounting to 890,287 cubic yards, and costing $82,692.16. By the State—Levee Work: New levee, 0.08 miles; enlargement, 9.18 miles; amounting to 226,888 cubic yards; costing $43,981.75.

This represents a total of 0.99 miles of new levee, 13.44 miles of enlargement; amounting to 464,564 cubic yards, costing $93,564.68; and 30.01 miles of drainage work, amounting to 22.54 miles of clearing, and 890,287 cubic yards of excavation, costing $108,251.36, or a total expenditure for work in the district done by contract of $200,816.04.

The district also expended $3,309.05 in protection and emergency work rendered necessary during high water, in weed cutting, etc., and in ordinary repair work not measurable in cubic yards.

The lines of continuous public levee in the district, as well as their general efficiency, remain practically the same as reported in the biennial report of the Board of State Engineers preceding this.

The only extension to the levee line of the district attempted during the period covered by this report was on the Atchafalaya River below Melville. This work was, however, unfortunately not

finished at the time of the advent of the high water of 1903, and, being at the lower end of the system, where the high water must naturally escape around it with great force to the low-lying territory behind, a large part of the work done was thereby lost. Work on this extension was resumed about March 1st last, and is still in progress.

No serious stage of water was reached in any of the streams affecting this district, during the period covered by this report, until the spring of 1903. During this time, however, very high stages prevailed in all the streams affecting the district, as follows:

On Red River: At Alexandria the water, on March 27, 1903, reached a stage of 36.2 on the gauge, that is, within 2 feet of that of 1892, the highest water of record at that point; from Alexandria to Egg Bend, this difference gradually diminished to a stage about equal to that of 1892; from Egg Bend to David's Ferry, the high water of 1892 was gradually exceeded until at David's Ferry it was about a half a foot higher; at its mouth, Red River was somewhat lower than the high water of 1897, the highest of record there.

On Bayou des Glaizes: The high water of 1903 reached a stage within three quarters of a foot of that 1897 at Moreauville, and within one-quarter of a foot of that of 1897 at Simmsport, where the high water of 1897 was the highest of record by about two and one-half feet.

On the Atchafalaya River: The high water of 1903 varied from a height about a quarter of a foot below 1897 at Simmsport, to a height 1.7 higher than 1882, the highest of record, at Melville, or 38.7 on the gauge there, on April 4th, 1903, as compared with 37.0 on May 16th-19th, 1882.

Notwithstanding this high stage of water against the long lines of levee in the district, extending over a period of four months, the district was at no time during this period given any serious cause for apprehension for its safety from overflow.

Besides the work of levee building and enlargement to protect the district from overflow, from the high waters prevailing from time to time in the streams bordering and traversing it, the district, under authority given it by law, has, during the past two years, continued a system of drainage to relieve certain areas from overflow from rainwater, where natural drains have been interrupted by reason of the extension of the lines of public levee across natural channels, previously affording relief during periods of low water in the main streams.

In this way, the district has, during the past two years, completed a line of work for improving drainage from Alexandria to Chatlin's Lake, and from Mill Bayou to Turner's Bayou, and still has under contract work for improving drainage from Chatlin's Lake to Three Prong Lake, from Three Prong Lake to Bayou des Glaizes, from Turner's Bayou to Bayou Jack, involving an expenditure of about $259,043.68.

As an adjunct to the project for improving drainage from Alexandria to Bayou des Glaizes, the district, upon the recommendation of the Board of State Engineers, closed Bayou Lamourie, at the point of its departure from Bayou Bœuf, by a dam, supplemented by a siphon over it to furnish running water for domestic purposes to the inhabitants dwelling along the banks of Bayou Lamourie, and for watering stock.

Through the intemperate and lawless action of a number of unknown parties, this dam was destroyed on the night of May 10, 1903. A resume of the reasons for building this dam, and a history of its effect upon the situation up to the time of its destruction is given in Appendix B.

The Red River, Atchafalaya and Bayou Bœuf Levee District also essayed certain other work in the district, during the past year, which was somewhat of a departure from the usual order of things for a levee organization. Considerable uneasiness had, for quite a-while been felt by the City of Alexandria and country below in regard to the condition of a part of the front of the city, at the lower end of the reach extending from Bayou Rapides to Beauregard Street, which had been revetted some years back by the National Government.

At the lower end of this protection work, the slope of the river bank had been gradually growing steeper for some years past, until there was reason to believe that, though not strictly a caving bank, it might slip or cave off to a greater or less extent, and possibly carry a part of the levee line with it.

The levee line here, upon which Alexandria, and the district below is dependent for protection, is rather close to the river bank, and any recession of the latter would be a source of more or less anxiety to all concerned.

To move the levee back would involve the sacrifice of valuable property, which it was desirable, if possible, to avoid.

It was, therefore, suggested that the City of Alexandria, the Parish of Rapides, and the Red River, Atchafalaya and Bayou Bœuf Levee District, all directly concerned and interested in the

situation, might jointly contribute to undertake some system of protection for the river bank at the locality in question.

This suggestion was finally favorably considered by the three authorities named, and an agreement upon that basis arrived at, by which the cost of the protection work necessary might be jointly met by them, the plans and specifications for the project to be approved by the Board of State Engineers.

Under this agreement some 34,000 square feet of timber mattress work, weighted with stone, was placed in position, and the foot of the slope graded and protected with loose rock, at the exposed point, at a cost of $3,649.72.

The result so far is very assuring.

Attention is called to certain special reports to the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District, appearing in Appendix B.

The Courtableau Levee District, in the Parish of St. Landry, was created by Act 166 of 1902. It comprises an area of about 76 square miles, south of aByou Courtableau and east of the "back lines of grants on the Teche." The Act provides for the appointment of three levee Commissioners and authorizes the issuance of bonds to the amount of $40,000.

It was estimated that a line of levees on the banks of Bayou Courtableau and the Atchafalaya, as contemplated in the Act creating the district, would cost not less than $140,000. In view of the limited area of the district, the small amount of revenue it could supply, and of the fact that high water in the Atchafalaya would pass around the lower end of a levee and overflow a considerable part of it with "back water," it was wisely concluded by the levee commissioners, at their meeting of October 2nd, 1902, to take no immediate action for undertaking levee work.

If this district could join with the Red River, Atchafalaya and Bayou Bœuf Levee District in closing Bayou Courtableau, and thence extend its levee line down the Atchafalaya, the same degree of protection might be secured, and the cost of a levee line along Bayou Courtableau, estimated at as much as $90,000, might be saved.

STAGE OF THE RIVERS.

During the spring of 1903, the Mississippi River, at most of the stations where its stages, from Arkansas City south, have

been recorded, established for itself a new record for the high water, as shown by the following table:

Locality.	1903. ft.	1897. ft.	Difference. ft.
Arkansas City, Ark.	53.0	51.9	1.1 above
Greenville, Miss.	49.1	46.75	2.35 above
Lake Providence, La.	46.4	44.54	1.86 above
Vicksburg, Miss.	51.8	52.48	0.68 below
St. Joseph, La.	48.0	47.58	0.42 above
Natchez, Miss.	50.4	49.82	0.58 above
Red River Landing, La.	50.0	50.20	0.2 below
Baton Rouge, La.	40.0	40.65	0.65 below
Donaldsonville, La.	32.2	32.75	0.55 below
Carrollton, La.	19.4	19.17	0.23 above
Fort Jackson, La.	8.1	7.2	0.9 above

On Red River, while the highest stages recorded, during this time, at Fulton, Shreveport, Alexandria, and Red River Landing, were more or less lower than those of the highest previous record, at a number of intermediate points, by reason of adjustment of slope and other local causes, stages were reached greatly exceeding those of previous record, as much, at points as two and one-half feet.

On Bayou des Gaizes, the high water of 1903 did not exceed the highest of previous record, whihc, at Moreauville, occurred in 1882, and at Simmsport, in 1897, though closely approximated at both points.

On the Atchafalaya River, the highest water of previous record (1897) was reached within about two-tenths of a foot at Simmsport and gradually exceeded below there, until, at Melville, the high water of 1903 was 1.7 feet higher than ever before (1882).

On Bayou Lafourche, the flood of 1903, though failing to reach a stage equal to that of previous record at Donaldsonville, by about six-tenths of a foot, developed, previous to the breaks which occurred in its levee line on the right bank, higher stages than ever before, on all parts of the bayou from 25 to 50 miles below its head.

Notwithstanding these very high stages of water, but seven crevasses producing any general effect are to be recorded in the State in 1903, as follows: On the Mississippi River, three (Hollybrook, Hymelia, and Magnolia, the latter being promptly closed); on Red River, one (Thompson's); on Bayou Lafourche, three (Falgout's, Guidry, and Howell's), the aggregate width of all of which did not exceed one mile.

In the Grand Priarie Levee District, the lower end of the levee system on the left bank of the Mississippi River, there were, however, several small breaks of local effect, aggregating about three-quarters of a mile in width.

At this date, April 20, 1904, the stages of the upper rivers show no indication of any flood this season, sufficient, with the generally improved condition of the levee system of the State, to cause anxiety or alarm.

BAYOU LAFOURCHE.

Act No. 9 of the Legislative Session of 1900, taking cognizance of the physical conditions prevailing on Bayou Lafourche, which made it impracticable to protect the lands adjoining it from overflow, authorized the Atchafalaya Basin and Lafourche Levee Boards to close Bayou Lafourche by a lock so as to divorce it from the Mississippi River, and thereby exclude from it the flood waves which resulted annually in breaches in its levee lines, and more or less general overflow. Act No. 9 required the approval of the Congress of the United States to the project.

The Rivers and Harbors Bill of the United States Congress, known as Public Document No. 154, approved June 13, 1902, authorized the construction of said locks and a temporary dam to protect them during construction, provided certain additional sanction was obtained from the Legislature of the State of Louisiana.

Act No. 84 of the Legislative Session of the State of Louisiana of 1902, granted the authority required by the Act of Congress, authorized the construction of a temporary dam at Donaldsonville to enable the construction of the locks, required the maintenance of a fresh water channel in Bayou Lafourche to be not less than six feet deep by sixty feet wide, and gave to the Levee Boards authorization and power to do all things necessary to carry out the purposes of the law.

The Atchafalaya Basin and Lafourche Levee Boards at once began work and requested the Board of State Engineers to submit to them plans and specifications to carry out the project. On October 10, 1902, the Board of State Engineers, in a detailed report to the levee boards, which appears in Appendix B, outlined the work necessary to be done under this project.

The Levee Boards were about to proceed in accordance with this report, when, on January 10, 1903, they were enjoined from

any and all work under said project by certain property holders on Bayou Lafourche opposed to the project. The case was taken up by the local courts, and then, by the Supreme Court of the State of Louisiana, and on June 30, 1903, a final decision was rendered authorizing the Levee Boards to proceed with the work.

On October 10, 1903, the Levee Boards entered into contract to dredge Bayou Lafourche to the depth required by law, and to construct the Lake Bœuf Canal, which taps the drainage basin of an area covering 425 square miles, the purpose of which was to partly divert the drainage of this area from Lake des Allmands to Bayou Lafourche, thereby acting as a supply of fresh water.

On November 12, 1903, the construction of the dam was begun at Donaldsonville, and on December 10, 1903, Bayou Lafourche was cut off by an earthen embankment from the Mississippi River. When Bayou Lafourche was divorced from the Mississippi River the water in it fell to the level of the Gulf of Mexico, into which the bayou empties. Soundings taken at this time showed that the bed of the Bayou consisted of a series of bars and pools, the crest of a few bars being about one foot below the level of the Gulf, and the pools varying from 5 feet to 14 feet below the level of the Gulf. The Levee Boards devoted their efforts to cutting out the crest of these bars with dredges, and at the present day there remains about 3½ miles of bars which are being cut as rapidly as possible by two dredges. When these dredge boats meet there will, at no place, be a depth of water in Bayou Lafourche less than 3½ feet above the highest bars, and of generally 6 feet or more throughout the stream. The dredges will then be put to work cutting the bars over which there is only 3½ feet, so as to bring the whole bayou to a six-foot depth as rapidly as possible.

In addition to this, parties owning private canals which communicate with Lake Salvador have requested permission of the Levee Boards to open these canals into Bayou Lafourche. The Levee Boards have given this permission, surrounding it with the safeguards necessary to exclude salt water from Bayou Lafourche, should it show a disposition to enter through these canals.

The result is that at the time of this report one of these canals is probably open into Bayou Lafourche, connecting it by water with Lake Salvador, which in turn connects with Company and Harvey's Canals. Company Canal is connected by locks with the Mississippi River, and a lock is being built at Harvey's Canal, which will be completed in six months, and which will open this

canal into the Mississippi River. The result is that an all-water route is being established from the City of New Orleans, through Company Canal, Lake Salvador, Harang Canal and Bayou Lafourche, which will give water transportation all of the year on that stream, a condition which never has existed in the past owing to the many shoal bars which existed in Bayou Lafourche during the low water periods of the past. This all-water route, which, at the present, will have a depth of 3½ feet of water over the shoalest bars, will very shortly be made a route six feet deep.

Owing to the delay from litigation and causes over which the Levee Boards had no control, it became necessary for them to ask Congress to extend the time fixed for the completion of the locks at Donaldsonville. Congress has passed a special Act authorizing this extension of time, so that the work bids fair to progress now without further interruption.

The Levee Boards are considering additional plans for the supply of fresh water to Bayou Lafourche, some of which involve the erection of pumps at Donaldsonville, to suply the five 18-inch siphons which have been placed over the dam. These siphons will run of their own accord at the medium and high stages of the Mississippi River and at the low stages of the river they can be supplied by a pumping plant, the cost of which would be moderate compared to the benefits derived.

The result of the project is that at this date there is no high water in Bayou Lafourche, while in the past, disastrous crevasses occurred as a result of excessive high floods on Bayou Lafourche, when the height of the Mississippi River was even less than it is at the date of this writing.

NEW BASIN CANAL AND SHELL ROAD.

During the last two years, the Board of Control of the New Basin Canal and Shell Road has, to the full extent of the means at its disposal, continued the improvement of the State property confided to its care. It has undertaken the construction of 10,300 feet of revetment, covering the stretch from Magnolia Bridge to Carrollton Avenue. This revetment of the west bank of the canal was rendered necessary by the sloughing of the bank into the canal, resulting in its encroachment upon the road bordering the canal. The revetment has been designed on the same lines as that previously built on other parts of the canal, and of this 7,000 feet

is already constructed. The balance of the work will be completed within the next sixty days, when the entire west bank of the canal, from its head at Rampart Street, to its mouth at Lake Pontchartrain, will be continuously revetted. For 5,000 feet the space between the revetment and the road has already been refilled by dredging, thereby widening and restoring to efficient condition the roadway bordering the canal.

In addition to this the Board has dredged the east bank of the canal between Carrollton Avenue and the Mississippi Valley R. R. Bridge, to a depth of 12 feet.

The Board of State Engineers prepared for the Board of Control of the New Basin Canal and Shell Road plans and specifications for the extension, and rectification of the west jetty at West End. The undertaking of this work, in contemplation by the Board of Control, has been postponed until the completion of the revetment, which has consumed all of the means at its disposal at this time.

In addition to this, several engineering questions were submitted to this Board by the Board of Control, the most important of which was the location of the crossing of the canal by the Louisiana Railways and Navigation Company, and the running of the line of the said railroad on the east bank of the canal. Also the construction of draw bridges by the said railway company, and by the New Orleans Railways Company over the canal, which resulted in the adoption of long span draw bridges to be operated by power instead of by hand, as has been done in the past, so that the navigation of the canal might be facilitated thereby.

The New Basin Canal property has steadily improved in the last two years, and greater facilties have been offered to the traffic plying on it. The result is apparent from the increase of tonnage entering the canal and the revenues of the Board of Control.

SURVEYS OF STATE LANDS.

Under several Acts of the Legislature of 1902 (Nos. 123, 124 and 171), it is provided that the Governor may direct the Board of State Engineers to make surveys and sub-divisions necessary for identification, description, entry and sale of unsurveyed lands of the State. But as no appropriation was made for the expenses of the work, the only surveys under these Acts thus far under-

taken have been, with one exception, such as parties in interest have arranged to have made without cost to the State.

Land surveying—especially the surveying of public lands—is a distinct art, and of course, should be done with better skill and judgment by surveyors who make it their regular business, and have local knowledge of land lines and corners in their own neighborhood than by others; and hence the Parish Surveyors throughout the State are probably better qualified to make these surveys than anyone else.

It is to be expected that there will soon be a very large amount of such work required in the State—enough to keep the Parish Surveyors, and others also, occupied in many parishes for years to come.

There is no apparent necessity nor any sufficient reason for putting these surveys in charge of the Board of State Engineers. It would seem reasonable that they might be made to the best advantage of the State through the direct administration of the State Land Office; though whatever department may be put in charge of them, it is probable that the only practicable method of getting the work properly done will generally be by retaining the services of the Parish Surveyors, or other surveyors in the vincinity of the work required.

It is, therefore, respectfully suggested that the Legislature be recommended to so amend the several Acts above referred to as to put the land surveys of the State in charge of the Register of the State Land Office, and that sufficient appropriation be made for the work that may be required.

APPENDICES.

A number of tabular statements showing details of the levee work of the past two years, and other statistics are presented herewith, as also copies of sundry special reports and letters relative to matters deemed of public interest. Though they are not in all cases referred to in the text of the Report, they are submitted as a part thereof, in the following appendices, viz:

APPENDIX A—Tabular statements relative to quantity, length and cost of levee work undertaken by the State of Louisiana, the several Boards of Levee Commissioners, and the United States, in Louisiana and a part of Arkansas, from April 21, 1902, to April 20, 1904.

APPENDIX B—Copies of sundry special reports, letters, etc., from the Board of State Engineers to the various Levee Boards and Commissioners, and to others. Also statements relative to resources of the levee Districts and State for levee purposes, and relative to length of levee lines, and high water records.

In conclusion, the Board of State Engineers wishes to record the fact that though Henry B. Richardson's name does not appear among the signatures to this Report, owing to his having recently severed his connection with this department, it has, nevertheless, been largely prepared under his direction and supervision.

All of which is respectfully submitted,

The Board of State Engineers,

FRANK M. KERR,
Chief State Engineer,
SIDNEY F. LEWIS,
ARSENE PERRILLIAT,
M. P. ROBERTSON,
GERVAIS LOMBARD,
Assistant State Engineers.

WALTER H. HOFFMAN,
Secretary.

APPENDIX A.

TABULAR STATEMENTS RELATIVE TO QUANTITY, LENGTH AND COST OF LEVEE WORK UNDERTAKEN BY THE STATE OF LOUISIANA, THE SEVERAL BOARDS OF LEVEE COMMISSIONERS, AND THE UNITED STATES, IN LOUISIANA AND A PART OF ARKANSAS, FROM APRIL, 21, 1902 TO APRIL 20, 1904.

NOTE:—The number of cubic yards given in the following statements for work done by the levee districts is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest, or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT

Levee work undertaken by the State of Louisiana in the several Levee to April 20, 1904, with seven contracts of earlier

Number	NAME OF CONTRACT	PARISH	DATE OF		LINEAR FEET	
			Contract	Final Certificate	New Levee	Enlargement
			FIFTH LOUISIANA LEVEE			
1	Opossum Pt. to Wilson Pt..	E. Carroll.....	Aug. 5.1903	Nov.12,1993	.....	5,885
2	Wilson Pt.....	E. Carroll.....	Sep. 10, 1903	Mch.28,1904	.....	5,835
3	Donna Vista.....	E. Carroll.....	Sep. 10, 1901	Sep. 27, 1902	.....	6,300
4	Longwood	E. Carroll.....	Sep. 10, 1903	.....	.....	7,400
5	Elton.....	E. Carroll.....	Sep. 10, 1903	.....	.....	16,279
6	Alsatia.....	E. Carroll.....	Nov.19, 1901	Nov. 3, 1902	.....	10,450
7	Cabin Teele.....	Madison	Sep. 10, 9011	May26, 1902	3,337	4,225
8	Killarney.....	Madison	Jan.15, 1900	Jan. 5, 1903	8,675	.....
9	Lower Concordia.....	Concordia	Nov.25, 0021	Apl. 9, 1904	46,370	.....
	Totals	.....	.....	.....	58,382	56,374
	Less amount done previous	to April 21, 1902..	.....	.....	3,337	6,027
	Work done from April 21,	1902, to April 20,	1904.....	.....	55,045 or 10.42 mi	50,347 or 9.53 mi.

No. 1. STATE CONTRACTS.

Districts, under thirty-seven contracts entered into from April 21, 1902, date, not completed April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT.				
9,050	40.	3,620 ..	Mississippi Riv	
54,700	18.9	10,338 30	Mississippi Riv	
42,608	12.48	5,317 47	Mississippi Riv	
38,000	19.9	7,562 00	Mississippi Riv	
106,000	21.98	23,298 80	Mississippi Riv	
64,135	22.	14,109 70	Mississippi Riv	
60,387	11.97	7,228 32	Mississippi Riv	
200,170	12.19	24,400 72	Mississippi Riv	
351,590	11.7	41,136 03	Mississippi Riv	
926,640	.....	137,011 34		
99,193	.....	13,242 33		
827,447	.....	123,769 01		
.....	.....	.....	.....	Average price 14.95 cents per cubic yard

APPENDIX A. STATEMENT

Number	NAME OF CONTRACT	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
			ATCHAFALAYA BASIN LEVEE			
10	Fannie Richie	Pt. Coupee	July 15, 1902	June 3, 1902	.....	3,141
	Claiborne to Dairies Sec.	.....	.....	.....	.....	1,501
11	Lakeland	Pt. Coupee	Jan. 14, 1903	.....	.....	.....
	Enlargement	.....	.....	.....	.....	21,136
	Irwin	.....	.....	.....	2,266	.....
	Taylor	.....	.....	.....	927	.....
	Chapman	.....	.....	.....	587	.....
12	Belmont to Viola	W. Baton R'ge	Jan. 15, 1902	July 14, 1903	.....	11,490
	Totals	.....	.....	.....	3,780	37,268
	Less work done previous to	April 20, 1902	.....	.....	.....	11,006
	Work done from April 21,	1902, to April 20,	1904	.....	3,780 or 0.72 mls	26,262 or 4.97 mls
			PONTCHATRAIN LEVEE			
13	Arlington	E. Baton R'uge	May 16, 1902	Dec. 5, 1903	6,125 or 1.16 mls	.....
			LAFOURCHE BASIN LEVEE			
14	Starlight to Fairfield	Jefferson	Oct. 12, 1903	Mar. 31, 1904	.....	14,668
	Westwego		.....	.....	.....	3,310
	Ames		.....	.....	.....	5,587
15	Beauregard	Jefferson	Aug. 5, 1903	Oct. 1, 1903	.....	2,920
16	Magnolia	Plaquemines	Aug. 4, 1903	Jan. 20, 1904	2,514	.....
	Totals	.....	.....	.....	2,514 or 0.47 mls	26,485 or 5.02 mls

No. 1.—Continued. STATE CONTRACTS.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT.				
16,359	20.	$ 5,862 80	Mississippi Riv	
12,955			Mississippi Riv	
.....	14.95	.....	Mississippi Riv	
157,719			Mississippi Riv	
55,775		36,035 62	Mississippi Riv	
16,731			Mississippi Riv	
10,816			Mississippi Riv	
105,201	18.95	19,935 58	Mississippi Riv	
375,556	.....	$ 61,834 00		
49,596	.....	9,570 23		
325,960	.....	$ 52,263 77		
.....	.....	.....	.....	Average price 16.03 cents per cubic yard
DISTRICT.				
269,139	18.5	$ 49,790 71	Mississippi Riv	
DISTRICT.				
55,502				
12,509	32.	$ 30,940 16	Mississippi Riv	
28,677				
14,054	19.50	2,740 53	Mississippi Riv	
32,652	17.90	5,844 70	Mississippi Riv	
143,394	.....	$ 39,525 39		
.....	.....	.....	.....	Average price 27.56 cents per cubic yard

APPENDIX A. STATEMENT

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
					LAKE BORGNE BASIN LEVEE	
17	Upper St. Bernard	St. Bernard	Aug. 26, 1902	Oct. 21, 1903	....	6,864
18	Pearl	Plaquemines	Oct. 31, 1902	Jan. 14, 1904	....	7,745
19	Louisiana Store	Plaquemines	Dec. 15, 1903	Mar. 18, 1904	1,607	....
	Work done from April 21, 1902, to April 30, '04				1,607 or 0.27 mile	14,609 or 2.76 mile
					GRAND PRAIRIE LEVEE	
20	Grand Prairie	Plaquemines	Sept. 10, 1903	Feb. 24, 1904	2,309	9,303
21	Devils Flats	Plaquemines	Aug. 26, 1902	Dec. 19, 1902	7,050	7,220
22	Bayou Goubray to New Canal	Plaquemines	Dec. 26, 1903	Mar. 14, 1904	14,165	....
	Work done from April 21, 1902, to April 30, '04				23,524 or 4.46 miles	16,573 or 3.14 miles
					BURAS LEVEE	
23	Buras—	Plaquemines	Oct. 12, 1903	Mar. 1, 1904	....	....
	Giordana Sect.				....	618
	Organe Farm Sect.				....	1,510
	Vacaro Sect.				....	900
	Pignola Sect.				922	....
	Vacherie Sect.				1,318	....
	Otari Smith Sect.				2,108	....
24	Boothville	Plaquemines	Aug. 26, 1902	Dec. 26, 1903	....	....
	Boothville Sect.				....	2,115
	Leavy Sect.				1,800	....
	Booth Sect.				800	....
	Work done from April 21, 1902, to April 30, '04				6,732 or 1.28 miles	5,130 or 0.97 mile

No. 1.—Continued. STATE CONTRACTS.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT.				
24,311	19.6	4,764.95	Mississippi Riv	
29,960	15.25	4,568.90	Mississippi Riv	
16,632	17½	2,910.60	Mississippi Riv	
70,903	.....	12,244.45		
.....	.....	.....	.....	Average price 17.27 cents per cubic yard.
DISTRICT.				
42,525	14.9	6,336.22	Mississippi Riv	
30,530	11⅔	3,561.83	Mississippi Riv	
36,901	13.88	5,121.85	Mississippi Riv	
109,956	.....	15,019.90		
.....	.....	.....	.....	Average price 13.66 cents per cubic yard.
DISTRICT.				
.....	.....	.....		
1,668	17⅔	294.65	Mississippi Riv	
3,741	.....	660.94	Mississippi Riv	
3,920	.....	692.53	Mississippi Riv	
5,817	.....	1,027.67	Mississippi Riv	
9,162	.....	1,618.62	Mississippi Riv	
15,184	.....	2,682.51	Mississippi Riv	
.....	.....	.....	Mississippi Riv	
4'856	17.24	837.17	Mississippi Riv	
8,502	.....	1,465.74	Mississippi Riv	
5,433	.....	936.65	Mississippi Riv	
58,283	.....	10,216.51		
.....	.....	.....	.....	Average price 17.53 cents per cubic yard.

APPENDIX A. STATEMENT

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
					CADDO	LEVEE
25	Thompson—	Caddo	Act 70,	Sept. 21, '03	2,980	.....
	Elmer Sect.	Caddo	1900	Sept. 21, '03	3,612	.....
26	Magnolia	Caddo	Nov. 1, 1902	June 11, '03	2,820	.....
27	Campo Bello	Caddo	Oct. 29, 1902	Aug. 24, '03	4,925	130
	Work done from April	21, 1902, to A	pril 20, '04..	.....	14,387	130
					or 2.72 mls	or 0.02 mls
					BOSSIER	LEVEE
28	Willow Bend	Bossier	Jan. 15, '02	June 16, '02	.....	8,000
29	Rough and Ready	Bossier	Sept. 10, '03	.....	3,104	.....
30	Gold Dust-Hopewell—	Bossier	Oct. 29, '02	Sept. 2, '03	.....	.....
	Gold Dust Sect.	.....	.....	.....	4,356	.....
	Hopewell Sect.	.....	.....	.....	4,665	.....
	Elm Grove Sect.	.....	.....	.....	3,242	.....
	Van Hoose Sect.	.....	.....	.....	3,386	.....
		Totals	.....	.....	18,753	8,000
	Less work done previous	to April 20, '02	.....	.....	.....	2,700
	Work done from April	21, 1902, to A	pril 20, '04	.....	18,753	5,300
					or 3.55 mls	or 1.00 mls
			RED RIVER, ATCHAFALAYA AND			
31	Bayou Rapides	Rapides	Nov. 24, '03	Jan. 15, '04	.....	718
32	Watts Lane to Sandusky	Rapides	Oct 26, '03	.....	.....	19,840
33	Upper Choctaw Bayou	Rapides	Oct. 12, '03	.....	.....	3,840
34	Jack Wilson—	Rapides	Aug. 5, '03	.....	.....	1,840
	Hathorne Sect.	.....	.....	.....	.....	1,340
35	Sunny Home	Rapides	Aug. 4, '03	Jan. 26, '04	.....	9,450
36	Bordeloneville	Avoyelles	Jan. 14, '03	Sept. 17, '03	.....	9,950
37	Glen Mary to Yellow Bayou	Avoyelles	Oct. 22, '01	May 26, '02	448	20,700
		Totals	.....	.....	448	67,678
	Less work done previous	to April 21, 19	02, and			
	Not completed April 20,	04	.....	.....	.....	19,180
	Work done from April	21, 1902, to A	pril 20, '0	4.....	448	48,498
					or 0.08 mls	or 9.18 mls
	Amouts deducted as abo	ve—				
	Work done previous to	April 21, 1902.	.....	.....	.....	16,000
	Work not completed Ap	ril 20, 1904...	.....	.....	.....	3,180
	Total to be deducted.	.....	.....	.....	.....	19,180

No. 1.—Continued. STATE CONTRACTS.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
DISTRICT.				
59,743	22.75	13,591.53	Red River.....	Caddo Board paid $1500.00 additional.
53,814	22.75	12,242.68	Red River.....	
30,865	12	3,703.80	Red River.....	
68,603	16.7	11,456.70	Red River.....	
213,025	.....	40,994.71	....	Average price 19.20 cents per cu. yd.
DISTRICT.				
61,167	14 4	8,808.04	Red River.....	
83,843	17.4	14,588.68	Red River.....	
	15.45		Red River.....	
75,475			Red River.....	
83,180		41,153.23	Red River.....	
58,442			Red River.....	
49,267			Red River.....	
411,374	.....	64,549.95		
19,000	.....	2,736.00		
392,374	.....	61,813.95	.....	Average price 15.75 cents per cu. yd.
BAYOU BOEUF LEVEE DISTRICT.				
3,321	48.	1,594.08	Bayou Rapides.	
89,987	22.23	20,004.11	Red River.....	
28,676	18.4	5,276.38	Red River.....	
4,200	19.98	839.16	Red River.....	
6,900	19.98	1,378.62	Red River.....	
43,706	17.5	7,648.55	Red River.....	
39,940	14.9	5,951.06	B'u des Gaizes	
84,258	16.5	13,902-57	B'u des Gaizes	
300,988	.....	56,594.53		
74,100	.....	12,612.78		
226,888	.....	43,981.75	.....	Average price 19.39 cents per cu. yd.
63,000	.....	10,395.00		
11,100	.....	2,217.78		
74,100	.....	12,612.78		

APPENDIX A. STATEMENT

RECAPITULATION.

DISTRICT	MILES	
	New Levee	Enlargement
Fifth Louisiana Levee District	10.42	9.53
Atchafalaya Basin Levee District	0.72	4.97
Pontchartrain Levee District	1.16	.....
Lafourche Basin Levee District	0.47	5.02
Lake Borgne Basin Levee District	0.27	2.76
Grand Prairie Levee District	4.46	3.14
Buras Levee District	1.20	0.97
Caddo Levee District	2.72	0.02
Bossier Levee District	3.55	1.01
Red River, Atchafalaya and Bayou Boeuf Levee District	0.08	9.18
Totals	25.13	36.59

No. 1.—Continued. STATE CONTRACTS.

Cubic Yards	Average Price	Cost	REMARKS
827,447	14.95	$123,769 01	
325,960	16.03	52,263 77	
269,139	18.50	49,790 71	
142,394	27.56	39,525 39	
70,903	17.27	12,244 45	
109,956	13.66	15,019 90	
58,283	17.53	10,216 51	
213,025	19.20	40,994 71	
392,374	15.75	61,813 95	
226,888	19.39	43,981 75	
2,637,369	17.05	449,620 15	

APPENDIX A. STATEMENT

Levee work undertaking by the Board of Commissioners of the Tensas
1902 to April

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Repair Lucca Loop and Opposum Fork Loop	Desha Co., Ark	.....	Oct. 13, '03	.....	.....
2	Fulton Lake	Desha Co., Ark	Sept. 3, '02	Mar. 12, 04	.....	22,042
3	Repair Gaines to Panther Forest	Chicot Co., Ark	.....	Dec. 22, '03	.....	.....
4	Repair Panther Forest	Chicot Co., Ark	.....	Nov. 21, '03	.....	.....
5	Spur Levee Leland Neck	Chicot Co., Ark	Oct. 14, '03	Feb. 1, 04		.....
6	Repair Vanclose	Chicot Co., Ark	.....	Nov. 25, '03	.....	.....
	Work done from April 21, 1902, to April 21, '04		.....	.....	.....	22,042 or 4.17 mls

No. 2. TENSAS BASIN LEVEE DISTRICT.

Basin Levee District, under six contracts entered into from April 21, 20, 1904.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
.....	.....	1,896.00	Mississippi Riv	
179,957	34½	62,085.16	Mississippi Riv	
.....	.....	2,736.00	Mississippi Riv	
.....	.....	2,982.00	Mississippi Riv	
129,199	19.35	25,000.00	Mississippi Riv	
.....	.....	2,016.00	Mississippi Riv	
309,156	.....	96,715.16		
.....	.....	.....	....	Average price 28.16 cents per cu. yd.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Fifth April 21, 1902 to April 20, 1904 with four con-

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAL FEET New Levee	LINEAL FEET Enlargement
1	Bunches Bend	E. Carroll	Aug. 12, '02	..	....	49,955
2	Opossum Pt. (topping)	E. Carroll	Aug. 5, '03	Mar. 8, '04	.....	8,355
3	Donna Vista Enlargement	E. Carroll	May 26, '03	Feb. 5, '04	.....	3,185
4	Donna Vista Enlargement	E. Carroll	Feb. 27, '04	.....	.....	3,110
5	Elton Banquette	E. Carroll	.....	.....	...	6,300
6	Holly Brook	E. Carroll	Aug. 10, '03	Feb. 13, '04	5,518	.....
7	Otter Bayou to Pt. Lookout	E. Carroll	Aug. 12, '02	Apr. 11, '04	.....	13,300
8	Ramp at Alsatia	E. Carroll	.....	Dec. 19, '02	.....	....
9	Willow Pt. Capping	E. Carroll	Feb. 29, '04	..	...	21,300
10	Pecan Grove to Henderson	E. Carroll	Sept. 30, '01	Sept. 8, '02	....	9,343
11	Mascot	Madison	Sept. 10, '03	....	3,238	....
12	Villa Vista, Milliken Bend Cabine Teele—	Madison	Feb. 21, '04	Apr. 11, '04	.....	.....
	Milliken Bend Sect	.....	.....		.....	1,475
	Cabin Teele Sect	...	..	..	.....	4,044
13	Road Crossing back of Killarney	Madison	.....	Dec. 19, '02	.....	..
14	Ramp at Killarney	Madison	.....	Dec. 19, '02	....	.....
15	Martin Loop to Bedford	Madison	July 10, '02	Oct. 24, '02	..	18,800
16	Martin Loop	Madison	.....	Apr. 13, '04	4,300	..
17	Martin Loop	Madison	Dec. 9, '03	Apr. 13, '04	3,200	.....
18	Hardtimes	Tensas	Aug. 12, '02	Mar. 2, '03	...	1,616
19	St. Joseph Front	Tensas	Dec. 2, '03		...	3,975
20	Harper	Tensas	Aug. 12, '02	Oct. 26, '03	.	13,600
21	Harper to Stockridge	Tensas	Sept. 16, '01	Dec. 20, '02	.	16,577
22	Cane Brake Banquette	Concordia	Jan. 12, '03	July 14, '03		8,005
23	Gordon Enlargement	Concordia	.....	Jan. 15, '03		500
24	Sycamore Topping	Concordia	Sept. 22, '02	May 12, '03	..	14,925
25	Sycamore	Concordia	Sept. 10, '03	Apr. 8, '04	6,432	3,660
26	Carter to Vidalia	Concordia	Sept. 10, '01	June 26, '02	....	28,210
27	Vidalia 1902	Concordia	May 14, '02	June 9, '02	830	1,300
28	Green	Concordia	Sept. 10, '03	Oct. 15, '03	732	..
29	Upper Green	Concordia	Sept. 10, '01	May 26, '02	..	9,393
	Fairview Sect	Concordia			4,230	.....
30	Upper Bougere Sect 1 and 2	Concordia	May 14, '02	Nov. 18, '02	13,300	..
31	Upper Bougere Sect 3	Concordia	May 14, '02	Mar. 2, '03	3,000	
		Total			41,830	241,768
	Less work done previous to April 21, 1902, and not completed April 20, 1904				2,030	89,182
	Work done from April 21, 1902, to April 20, 1904				39,800	152,586
					or 7.54 miles	or 28.89 miles
	Amount deducted as above				2,030	89,182
	Work done previous to April 21, 1902					48,392
	Work not completed April 20, 1904					40,790
	Total to be deducted				2,030	89,182

No. 3. FIFTH LOUISIANA LEVEE DISTRICT.

Louisiana Levee District under thirty-one contracts entered into from tracts of earlier date not completed April 21, 1902.

Cubic Yards	Price	Cost	Stream	Remarks
609,500	16	$97,520.00	Mississippi Riv	
13,884	30	4,165.20	Mississippi Riv	
18,714	12.5	2,339.25	Mississippi Riv	
21,200	14½	3,074.00	Mississippi Riv	
25,000	13.90	3,475.00	Mississippi Riv	
375,232	27.5	103,188.80	Mississippi Riv	
182,228	26	47,379.28	Mississippi Riv	
3,610	.....	794.20	Mississippi Riv	
35,000	25	8,750.00	Mississippi Riv	
58,273	12.97	7,558.01	Mississippi Riv	
100,000	19.9	19,900.00	Mississippi Riv	
.....	25	.....	Mississippi Riv	
3,531	.....	882.75	Mississippi Riv	
9,651	.....	2,412.75	Mississippi Riv	
337	.....	50.19	Mississippi Riv	
1,704	.....	228.08	Mississippi Riv	
29,841	35	10,444.35	Mississippi Riv	
160,082	32.74	52,410.84	Mississippi Riv	
142,428	31.24	44,494.50	Mississippi Riv	
22,192	22	4,882.24	Mississippi Riv	
49,403	39	19,267.17	Mississippi Riv	
142,248	24.73	35,177.93	Mississippi Riv	
107,121	30	32,136.30	Mississippi Riv	
28,841	10	2,884.10	Mississippi Riv	
3,629	25	907.25	Mississippi Riv	
16,301	20	3,260.20	Mississippi Riv	Revetment $325 additional.
140,788	16.75	23,581.99	Mississippi Riv	
103,518	12	12,422.16	Mississippi Riv	
22,924	15, 16, 20	3,985.40	Mississippi Riv	
9,084	24	2,180.16	Mississippi Riv	
52,322	15.4	8,057.59	Mississippi Riv	
63,163	.....	9,727.10	Mississippi Riv	
192,836	16.7	32,203.61	Mississippi Riv	
125,433	31.46	39,461.22	Mississippi Riv	
2,870,018	.....	639,201.62		
556,106	.....	98,256.37		
2,313,912	.....	540,945.25		
.....	.....	.....	.....	Average price 23.38 cents per cu. yd.
271,906	.....	51,797.37		
284,200	.....	46,459.00		
556,106	.....	98,256.37		

APPENDIX A. STATEMENT

Levee work undertaking by the Board of Commis.ioners of the Atchafa-
April 21, 1902, to April 20, 1904, with four contracts

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Dameron and White '02	.....	Jan. 1, '02	Feb. 10, '03	.....	.....
	Raccourci to Longw'd	.....	.....	.....	.....	900
	New Texas to Grand.	.....	.....	.....	.....	6,550
	St. Claude	.....	.....	.....	.....	3,840
	Solitude	.....	.....	.....	7,915	.....
	Lobdell Enlargement...	.....	.....	.....	.....	4,630
	St. Michael	.....	.....	.....	.....	3,165
	Marioneaux	.....	.....	.....	.....	3,210
	Bayou Goula	.....	.....	.....	.....	4,029
2	Dameron and White '03	.....	Jan. 12, '03	.....	.....	.....
	Poplar Grove	.....	.....	.....	.....	15,090
	Missouri Enlargem't.	.....	.....	.....	.....	4,000
	Missouri Wavewash..	.....	.....	.....	.....	3,232
	Hickey Capping	.....	.....	.....	.....	1,570
	Eliza	.....	.....	.....	1,300	.....
	Sardine Point	.....	.....	.....	.....	400
	Lefebvre	.....	.....	.....	1,700	.....
	Australia	.....	.....	.....	.....	8,500
	Plaquemines	.....	.....	.....	.....	12,795
	Palo Alto	.....	.....	.....	3,255	.....
	Texas	.....	.....	.....	800	.....
3	Morris Bayou	Pt. Coupee....	Sept. 2, '02	Dec. 30, '02	.....	1,680
4	Atchafalaya River	Pt. Coupee....	Jan. 1, '02	.....	50,466	.....
5	Oakley	Assumption ..	.....	June 24, '02	684	.....
6	Belmont Church	Assumption ..	.....	June 24, '02	.....	3,690
	Totals.....	.....	.....	.....	66,120	77,281
	Less work done previous to April 21, 1902, and not Completed April 20, 1904		.....	.....	16,848	6,992
	Work done from April 21, 1902, to April 20, '04		.....	.....	49,272 or 9.33 mls	70,289 or 13.31 mls
	The above is divided by Streams as follows—				miles	miles
	Mississippi River....	.....	.....	.....	2.52	12.30
	Atchafalaya River...	.....	.....	.....	6.68	0.31
	Bayou Lafourche....	.....	.....	.....	0.13	0.70
	Total	.....	.....	.....	9.33	13.31
	Amount deducted as above—					
	Work done previous to April 21, 1902		.....	.....	11,182	6,992
	Work not completed April, 1904		.....	.....	5,666	.....
	Total to be deducted....	.....	.....	.....	16,848	6,992

No. 4. ATCHAFALAYA BASIN LEVEE DISTRICT.

laya Basin Levee District, under six contracts, entered into from of earlier date not completed April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
.....	Scale	.....	Mississippi Riv	
12,457		$ 2,607.44	Mississippi Riv	
45,819		11,475.58	Mississippi Riv	
29,726		7,288.26	Mississippi Riv	
454,627		102,210.59	Mississippi Riv	
39,466		8,771.78	Mississippi Riv	
33,660		7,224.53	Mississippi Riv	
38,334		7,998.47	Mississippi Riv	
19,730		3,265.07	Mississippi Riv	
.....	Scale			
97,293			Mississippi Riv	
26,291			Mississippi Riv	
10,666			Mississippi Riv	
384			Mississippi Riv	
52,951			Mississippi Riv	
3,797		99,676.68	Mississippi Riv	
56,912			Mississippi Riv	
67,606			Mississippi Riv	
85,674			Mississippi Riv	
91,748			Mississippi Riv	
23,283			Mississippi Riv	
4,300	25.00	1,075.00	Atchafalaya R.	
692,000	19.00	13,148.00	Bayou Lafourche	
15,699	20.00	3,139.80	Bayou Lafourche	
16,086	Scale	2,235.85	Bayou Lafourche	
1,918,511		388,449.05		
373,814		73,875.77		
1,544,697		314,573.28		
.....	.....	.....	.....	Average price 20.36 cents per cu. yd.
1,057,873		222,482.22		
455,039		86,715.41		
31,785		5,375.65		
1,544,697		314,573.28		
242,253		48,879.18		
131,561		24,996.59		
373,814		73,875.77		

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Pontchar-

21, 1902 to

1	Benkin	Iberville	Feb. 8, '04	.....	.....	3,381
2	Jolisant	Iberville	July 11, '03	Jan. 19, '04	.....	2,813
3	Eighty-one Mile Pt. (Wave Wash)	Ascension	Jan. 12, '04	Feb. 22, '04	.....	3,320
4	Evergreen	Iberville	July 11, 03	Nov. 28, '03	.....	5,930
5	Hermitage	Ascension	May 28, '02	Sept. 24, '02	4,418	5,065
6	Hermitage (Wave Wash)	Ascension	Jan. 12, '04	Feb. 22, '04	.....	4,565
7	White Hall, Repair	St. James	Mar. 10, '04	.....	.....	8,660
8	New Hope	St. John	June 4, '02	Sept. 15, '02	2,442	.....
9	Hope to Terre Haute	St. John	July 11, '03	Mar. 1, '04	.....	16,321
10	Anchor Gypsy	St. Charles	Sept. 25, '03	Dec. 28, '03	.....	4,050
11	St. Rose to Almedia	St. Charles	Sept. 21, '03	Jan. 22, '04	.....	12,725
12	Butler-Kenner	Jefferson	July 11, '03	Nov. 13, '03	765	.....
13	Parish line to Hanson City	Jefferson	July 11, '03	Nov. 13, '03	.....	3,120
14	Kennerville	Jefferson	July 11, '03	Jan. 14, '04	.....	7,900
15	Trudeau	Jefferson	July 11, '03	Feb. 27, '04	.....	6,500
16	Weckerling Farm	Jefferson	Sept. 2, '03	Mar. 19, '04	1,982	3,585
17	Bois Blanc Enlargement	Jefferson	Sept. 21, '03	Feb. 27, '04	.....	1,749
18	Perkins	Jefferson	Dec. 8, '03	.....	2,514	20,900
	Totals	.....	.....	.....	12,121	110,584
	Less work not completed April 20, 1904	.....	.....	.....	.....	9,681
	Work done from April 21, 1902 to April 20, 19041	.....	.....	.....	12,121 or 2.30 mls	100,903 or 19.11 mls

No. 5. PONTCHARTRAIN LEVEE DISTRICT.

train Levee District, under eighteen contracts, entered into from April April 20, 1904.

34,000	14.75	$ 5,015.00	Mississippi Riv.	
28,756	18.44	5,302.60	Mississippi Riv.	
.....	.....	859.21	Mississippi Riv.	Price $25.88 per 100 ft.
54,311	18.44	10,014.94	Mississippi Riv.	
103,652	14.00	14,511.28	Mississippi Riv.	
.....	.....	1,181.42	Mississippi Riv.	Price $25.88 per 100 ft.
11,490	12.5	1,426.25	Mississippi Riv.	
87,470	20.4	17,843.88	Mississippi Riv.	
86,019	17.7	15,225.36	Mississippi Riv.	
35,302	36.00	12,708.72	Mississippi Riv.	
74,395	15.65	11,642.81	Mississippi Riv.	
29,062	19.94	5,794.96	Mississippi Riv.	
20,870	19.94	4,161.48	Mississippi Riv.	
41,146	19.94	8,204.51	Mississippi Riv.	
26,880	19.94	5,359.87	Mississippi Riv.	
71,741	19.9	14,276.45	Mississippi Riv.	
12,142	19.00	2,306.98	Mississippi Riv.	
147,300	17.95	26,440.35	Mississippi Riv.	
864,536	.....	162,276.07		
69,950	.....	11,468.02		
794,586	.....	150,808.05		
.....	.....	.....	.....	Average Price 18.98 cents per cu. yd.

APPENDIX A. **STATEMENT**

Levee work undertaken by the Board of Commissioners of the La-
April 21, 1902, to April 20, 1904, with one con-

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Donaldsonville to Comp any Canal 1902		Mch. 5, 1902	Mch. 3, 1903		
	Sect'ns—					
	Dugas to Cofield					5,960
	Rateau Store				1,252	
	Cofield				722	3,949
	Point Pleasant				5,360	
	Pt. Plsnt. to Welcome				718	21,037
	Avondale				1,382	
	Avondale				940	
	Tete Enlargement					3,969
	Platenville down					8,280
2	Donaldsonville to Comp any Canal 1903		Mch. 3, 1903	Apr. 6, 1904		
	Sect'ns—					
	Dugas to Cofield					3,754
	Acadia				1,593	
	Welcome				3,970	
	Welcome Enlargem't					616
	Hymelia				1,856	
	Flagville				2,018	
3	Avondale Enlargement.	Jefferson		Sept.11,1902		785
4	Live Oak	Plaquemines	Aug. 4, 1903	Jan. 26, 1904		4,250
5	Star	Plaquemines	July 10, 1902	Jan. 3, 1903	2,190	
6	Myrtle Grove Enlarge- ment	Plaquemines	Aug. 4, 1903	Apr. 13, 1904		4,495
7	Myrtle Grove	Plaquemines	Aug. 4, 1903	Oct. 1, 1903	1,073	
		Totals			23,074	61,325
	Less work done previous	to April 21, 19	02.		722	3,573
	Work done from April	21, 1902 to A	ows—		22,352	57,752
	The above is divided by	Streams as foll	pril 20, '04		or4.23mls	or10.94mls
	Mississipi River				4.23 mls	9.30 mls
	Bayou Lafourche					1.64
					4.23	10.94

No. 6. LAFOURCHE BASIN LEVEE DISTRICT.

fourche Basin Levee District, under six contracts, entered into from tract of earlierdate, not completed April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
.....	Scale			
54,959		11,067 18	Mississippi Riv	
34,042		7,525 76	Mississippi Riv	
50,089		9,270 36	Mississippi Riv	
147,101		31,750 84	Mississippi Riv	
181,296		34,842 73	Mississippi Riv	
34,697		7,288 39	Mississippi Riv	
23,573		4,985 69	Mississippi Riv	
21,647		4,956 07	Bayou Lafourche	
62,368		15,384 56	Bayou Lafourche	
.....	Scale			
17,497		3,535 26	Mississippi Riv	
42,396		9,042 56	Mississippi Riv	
123,464		28,342 14	Mississippi Riv	
3,079		519 80	Mississippi Riv	
32,338		5,811 29	Mississippi Riv	
41,516		7,966 05	Mississippi Riv	
5,479	26.	1,423 54	Mississippi Riv	
25,607	Scale	3,957 08	Mississippi Riv	
19,953	Scale	2,871 46	Mississippi Riv	
			Mississippi Riv	
16,934	Scale	2,559 08	Mississippi Riv	
11,990	Scale	1,845 11	Mississippi Riv	
976,650		199,983 46		
19,480		4,459 45		
957,170		195,524 01		Average price 20.43 cents per cu. yd.
892,635		179,642 83		
64,535		15,881 18		
957,170		195,524 01		

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Grand
April 21, 1902, to

Number	NAME OF CONTRACT.	PARISH	DATE OF		LINEAR FEET	
			Contract	Final Certificate	New Levee	Enlargement
1	Moran	Plaquemines ..	Jan. 4, 1904	Apr. 13, 1904	3,500	745
2	Bayou Goubray.....	Plaquemines ..	Aug. 11, 1902	Dec. 1, 1902	5,250	.....
3	New Canal.....	Plaquemines ..	Aug. 11, 1902	Jan. 12, 1903	5,315	.....
	Work done from April	21, 1902, to A	pril 20, 1904.	.....	14,065 or 2.66 mls	745 or 0.14 mls

No. 7. GRAND PRAIRIE LEVEE DISTRICT.

Prairie Levee District, under three contracts, entered into from April 20, 1904.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
9,326	13.	$ 1,212 38	Mississippi Riv	
12,231	11.	1,345 41	Mississippi Riv	
11,232	11.	1,235 52	Mississippi Riv	
32,789	.....	$ 3,793 31		
.....	.....	.....	.....	Average price 11.57 cents per cu. yd.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the entered into from April 21,

Number	NAME OF CONTRACT.	PARISH	DATE OF		LINEAR FEET	
			Contract	Final Certificate	New Levee	Enlargement
1	Sect. 1, Gulf Coast....	Plaquemines ..	Oct. 16, 1902	.....	65,255	.....
2	Sect. 2, Gulf Coast....	Plaquemines ..	Oct. 16, 1902	.....	60,099	.....
3	Sect. 3, Gulf Coast....	Plaquemines ..	Oct. 16, 1902	.....	44,445	.....
	Totals.....	.....	.....	.....	169,799	.....
	Less work not completed	April 20, 1904.	.....	.....	134,139	.....
	Work done from April	21, 1902, to A	pril 20, 1904.	.....	35,660 or 6.75 mls	.....

No. 8. PLAQUEMINE PARISH E. BANK LEVEE DIST.

Plaquemines Parish East Bank Levee District, under three contracts, 1902, to April 20, 1904.

Cubic Yards	Price—Cents	Cost	REMARKS
500,000	9.25	$ 46,250 00	
450,000	9.25	41,625 00	
400,000	9.25	37,000 00	
1,350,000	.....	$ 124,875 00	
1,176,845	.....	108,858 16	
173,155	.....	$ 16,016 84	
.....	.....	.....	Average price 9.25 cents per cubic yard

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the April 21, 1902, to

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Cavitt	Caddo	May 7, 1903	Mar. 28, '04	4,305	.....
2	Simpson Lake	Caddo	Dec. 3, 1903	Feb. 18, 1904	.....	2,150
3	Wild Lucia	Caddo	May 6, 1903	Oct. 6, 1903	4,783	.....
4	Hurricane Bluff	Caddo	Feb. 4, 1903	May 7, 1903	7,728	.....
5	Eric to Buckhall	Caddo	May 14, 1902	June 29, '03	19,199	.....
6	Babley	Caddo	Feb. 18, 1903	Oct. 13, 1903	.....	5,913
7	Long Point, Sect. 1	Caddo	Feb. 18, 1903	Aug. 11, 1903	1,653	.....
	Long Point, Sect, 2	Caddo	.....	.....	3,126	.....
8	Woodlawn	Caddo	Feb. 18, 1903	Aug. 11, 1903	.....	3,149
9	Ashwood	Caddo	Feb. 18, 1903	Sep. 21, 1903	.....	4,992
10	Upper Pascagoula—	Caddo	Feb. 18, 1903	Aug. 28, 1903	.....	810
	Logie Lea Sect.	.....	.....	.....	5,920	.....
11	White Hall	Caddo	Feb. 4, 1903	June 8, '03	3,479	.....
12	Cross Keys	Caddo	May 6, 1903	Sept. 2, 1903	5,472	.....
	Work done from April	21, 1902, to A	pril 20, 1904	.....	55,665 or 10.5 mls	18,814 or 3.56 mls

No. 9. CADDO LEVEE DISTRICT.

Caddo Levee District, under twelve contracts, entered into from April 20, 1904.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
100,007	17.4	$ 17,401 21	Red River.....	
10,281	50.	5,140 50	Red River.....	
79,517	15.4	12,245 61	Red River.....	
48,434	13.4	6,490 15	Red River.....	
226,975	13.45	30,528 13	Red River.....	
39,151	16.25	6,362 04	Red River.....	
26,333	16.25	4,279 11	Red River.....	
32,761	.....	5,323 66	Red River.....	
13,166	16.25	2,139 47	Red River.....	
19,100	16.25	3,103 75	Red River.....	
3,375	16.25	548 44	Red River.....	
102,339	16.25	16,630 08	Red River.....	
30,363	14.69	4,460 32	Red River.....	
94,393	17.5	16,518 77	Red River.....	
831,773	.....	$ 132,077 66		
.....	.....	.....	.....	Average price 15.8 cents per cubic yard.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Bossier to April

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Willow Chute	Bossier	Nov. 5, '02	Apr. 27, '03	3,118	.....
2	Buckhall	Bossier	Mar. 5, '02	Apr. 27, '03	2,426	.....
3	Scopini	Bossier	Aug. 6, '03	Feb. 29, '04	4,003	.....
4	Dortch	Bossier	Feb. 5, 03	Oct. 6, '03	9,673	.....
5	Christiana	Bossier	Nov. 16, '02	Mar. 16, '03	3,400	.....
6	Buckhorn	Bossier	Feb. 5, '03	June 16, '03	3,386	.....
	Lovely Point Sect.	.....	.....	.....	3,178	.....
7	Bear Point Spur	Bossier	Feb. 16, '04	.....	500	.....
8	Mulock Bayou	Bossier	Feb. 14, '04	.....	1,063	.....
9	Swift-Chute Bayou	Bossier	Feb 16, '04	.....	2,476	.....
	Totals	.....	.....	.....	33,223	.....
	Less work not complete	d April 20, '04.	.....	.....	619	.....
	Work done from April	21, 1902, to A	pril 20, '04	.....	32,604 or 6.17 mls	.....

No. 10. BOSSIER LEVEE DISTRICT.

Levee District, under nine contracts, entered into from April 21, 1902, 20, 1904,

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
23,547	13.9	$ 3,273.03	Red River.....	
18,227	15.69	2,859.81	Red River.....	
96,417	20.00	19,283.40	Red River.....	
236,815	17.8	42,153.07	Red River.....	
21,370	13.37	2,857.16	Red River.....	
22,451	15.9	3,569.70	Red River.....	
25,048	.....	3,982.63	Red River.....	
6,400	17.00	1,088.00	Red River.....	
15,300	18.00	2,754.00	Red River.....	
43,800	18.00	7,884.00	Red River.....	
509,375	.....	89,704.80		
10,950	.....	1,971.00		
498,425	.....	87,733.80		
.....	.....	.....	.....	Average price 17.6 cents per cubic yard.

APPENDIX A. STATEMENT

Levee work undertaken by the Board of Commissioners of the Red
tracts, entered into from April 21, 1902, to April 20, 1904, with

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement
1	Mill Bayou to Glen Mary	Avoyelles	Feb. 19,1902	June 16,1902		19,600
2	Harvey Bayou to Green Store	St. Landry....	Aug. 6, 1903	Dec. 14, 1903	842	4,455
3	Davis Bayou.....	St. Landry....	Dec. 12,1903	Jan. 25, 1904	537	
4	Elba	St. Landry....	Aug. 6, 1903	Oct. 30, 1903		4,515
5	Bayou Rouge Dyke....	St. Landry....	Aug. 6, 1903	Jan. 25, 1904		1,465
6	Melville	St. Landry....	Aug. 6, 1903	Jan. 25, 1904		7,400
7	Melville to Bayou Petite Prairie	St. Landry....	Mar. 27, 1901	Nov. 17, 1902	13,670	2,030
8	Bayou Petite Prairie, S.	St. Landry....	July 16, 1902		10,700	
		Totals	.....	.....	25,749	39,465
	Less work done previous	to April 21, 19	02, and not			
	Completed April 20, '04	.....	.....	.....	20,921	16,945
	Work done from April	21, 1902, to A	pril 20, 1904	.....	4,828	22,520
					or0.91 mls	or4.26 mls
	The above is divided by	Streams as foll	ows—			
	Bayou des Glaizes...	.....	.....	.....	.....	0.63 mls
	Atchafalaya River...	.....	.....	.....	0.91 mls	3.63
					0.91	4.26
	Amount deducted as ab	ove—				
	Work done previous to	April 21, 1902.	.....	.....	13,321	16,945
	Work not completed Ap	ril 20, 1904...	.....	.....	7,600	.....
	Total to be deducted.	.....	.....	.....	20,921	16,945

No. 11. RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Bœuf Levee District, under eight con- two contracts of earlier date not completed April 21, 1902.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
69,197	18.8	$13,009 03	B'u des Glaizes	
40,932	22.0	9,005 04	Atchafalaya R.	
10,705	22.	2,355 10	Atchafalaya R.	
19,818	15.9	3,151 06	Atchafalaya R.	
14,638	22.	3,220 36	Atchafalaya R.	
32,862	22.	7,229 64	Atchafalaya R.	
226,524	21.7	49,155 70	Atchafalaya R.	
193,285	19.95	38,560 35	Atchafalaya R.	
607,961		$125,686 28		
370,285		76,103 35		
237,676		$49,582 93		
15,197		$2,857 03		
222,479		46,725 90		
237,676		$49,582 93		Average price 20.86 cents per cu. yd.
217,000		$45,523 00		
153,285		30,580 35		
370,285		$76,103 35		

APPENDIX A. STATEMENT

Drainage work undertaken by the Board of Commissioners of the Red entered into from April 21, 1902 to April 20, 1904 with four

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	MILES Excavation	MILES Clearing
1	Alex. to Chatlins Lake	Rapides	Sept. 6, 01	Feb. 3, '04	14.34	14.34
2	Chatlins Lake to Three Prong Lake.....	Rapides and Avoyelles	Feb. 25, '04	.....	9.60	14.00
3	Three Prong Lake to Bayou des Glaizes...	Avoyelles	Feb. 7, '01	.....	17.30	14.50
4	Mill Bayou to Bayou Rouget..... Bayou Rouget to Turners Bayou.....	Avoyelles	Feb. 7, '01	Feb. 3, '04	12.80	12.80
5	Turners Bayou to Bayou Jack	Avoyelles.....	Feb. 7, '01	.....	2.50	2.50
		Totals	.....	.....	56.54	58.14
	Less work done-previous to April 21, 1902, and not completed April 20, 1904.....		.....	.....	26.53	35.60
	Work done from April 21, 1902, to April 20, 1904.....				30.01	22.54
	Amounts deducted as above:—					
	Work done previous to April 21, 1902....		.....	.....	14.43	20.00
	Work not completed April 20, 1904		.....	.....	12.10	15.60
	Total to be deducted.....		.....	.....	26.53	35.60

APPENDIX A. STATEMENT

Work for improvement of Bayou Lafourche undertaken by the Boards of under three contracts entered into

Number	NAME OF CONTRACT.	PARISH	DATE OF Contract	DATE OF Final Certificate	MILES New Levee	MILES Excavation
1	Bayou Lafourche Dam.	Ascension	Nov. 12, '03	Feb. 23, '04	0.08	.....
2	Bayou Lafourche, dredging	.....	Oct. 10, '03	.....	.....	12.12
3	Lake Bœuf Canal.....	.....	Oct. 10, '03	.....	.....	2.38
					0.08	14.50

No. 12. RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

River, Atchafalaya and Bayou Boeuf Levee District under five contracts contracts of earlier date not completed April 2,1 1902.

EXCAVATION				
Cubic Yards	Cost	Cost Clearing	Total Cost	REMARKS
465,930	46,360.03	$ 14,933.00	61,293.03	
175,000	25,375.00	29,400.00	54,775.00	
670,000	56,950.00	26,300.00	83,250.00	
305,357	27,482.13	19,243.52	46,725.65	
70,000	6,300.00	7,700.00	14,000.00	
1,686,287	162,467.16	97,576.52	260,043.68	
796,000	79,775.00	72,017.32	151,792.32	
890,287	82,692.16	25,559.20	108,251.36	
459,000	40,280.00	29,769.32	70,049.32	
337,000	39,495.00	42,248.00	81,743.00	
796,000	79,775.00	72,017.32	151,792.32	

No. 13. ATCHAFALAYA BASIN AND LAFOURCHE LEVEE DISTRICTS.

Commissioners of the Atchafaloya Basin and Lafourch Levee Districts from April 21, 1902 to April 20, 1904.

EXCAVATION		
Cubic Yards	Cost	REMARKS
38,614	15,566.04	
163,369	26,139.04	
75,921	12,147.36	
277,904	53,852.44	

APPENDIX A. STATEMENT

The Board of State Engineers is indebited to the Orleans Levee Board, Commissioners, under nine contracts, entered

Number	NAME OF CONTRACT	Parish	DATE OF		LINEAR FEET		Cubic Yards
			Contract	Final Certificate	New Levee	Enlargement	
1	Reconstr'tion of Clouet to Pauline St	Orleans	Oct. 24, '02	Mar. 27, '03	.....	2,200	29,946
2	Revetment Stanton to Beka st....		Sept. 20, '02	Feb. 26, '03	.....	.....	.....
3	Orleans Enlargement and Revetment		Sept. 8, '03	Feb. 23, '04	.....	8,255	59,788
4	Aurora Enlargement and Revetment		Sept. 16, '03	Mar. 18, '04	.....	6,783	37,645
5	Adams to Short st.....		Sept. 18, '03	Mar. 30, '04	1,495	.....	83,030
6	Algiers Point.....		Oct. 17, 03	Dec. 14, '03	.....	673	2,585
7	Third District Repair.....		Oct. 21, '03	Jan. 20, '04	.....	.....	.....
8	Material for Third District Repair		Sept. 16, '03	Jan. 12, '04	.....	.....	.....
9	Repair to N. O. & N. E. R. R. Fruit Shed.....		Dec. 19, '03	Jan. 29, '04	.....	.....	.....
	Totals.....		.....	.....	1,495 0.28 mls	17,911 3.39 mls	212,994

No. 14. ORLEANS LEVEE DISTRICT.

for the following Statement of work undertaking by the Board of into from April 21, 1902 to April 20, 1904.

Price—Cents	COST	Revetment Linear ft.	Pile—Bank Protection		B. M.	Price Cents	Cost of Woodwork	TOTAL COST
			Linear ft.	Price per ft. of Pile Cents				
25.00	$ 7,486.50	.....	2,200	17.00	258,478	25.75	$ 15,643.57	$ 23,130.07
.....	.....	6,517	.....	.....	225,666	24.80	5,596.51	5,596.51
28.00	16,740.64	4,500	.....	.....	242,733	46.00	11,210.73	27,951.37
19¾	7,246.66	6,891	.....	.....	292,046	44.00	12,874.67	20,121.33
34.00	28,230.20	1,495	.....	.....	103,981	43.50	4,523.19	32,753.39
19½	504.07	480	.....	.....	18,964	32.00	606.97	1,111.04
.....	.....	.....	500	9 2-5	148,000	10.50	5,225.13	5,225.13
.....	.....	.....	.....	.....	.....	.....	4,952.35	4,952.35
.....	.....	.....	.....	.....	.....	.....	.....	2,565.58
.....	$ 60,208.07	19,883	2,700	.....	1,289,868	.....	64,198.79	123,406.77
.....	.....	.....	.....	.....	.....	.....	.....	.....

APPENDIX A. STATEMENT

RECAPITULATION.

DISTRICT	MILES	
	New Levee	Enlargement
Tensas Basin Levee District	.....	4.17
Fifth Louisiana Levee District	7.54	28.89
Atchafalaya Basin Levee District	9.33	13.31
Pontchartrain Levee District	2.30	19.11
LaFourche Basin Levee District	4.23	10.94
Grand Prairie Levee District	2.66	0.14
Plaquemines Parish East Bank Levee District	6.75	.....
Caddo Levee District	10.50	3.56
Bossier Levee District	6.17	.....
Red River, Atchafalaya and Bayou Bœuf Levee Dis't.	0.91	4.26
Orleans Levee District	0.28	3.39
Totals	50.67	87.77

DRAINAGE.	MILES	
	Excavation	Clearing
Red River, Atchafalaya and Bayou Bœuf Levee Dis't.	30.01	22.54

IMPROVING BAYOU LAFOURCHE.	MILES	
	New Levee	Excavation
Atchafalaya Basin and Lafourche Levee District	0.08	14.50

No. 15. DISTRICT CONTRACTS

Cubic Yards	Average Price (Cents)		Cost	REMARKS
309,156	28.16		$ 96,715 16	
2,313,912	23.38		540,945 25	
1,544,697	20.36		314,573 28	
794,586	18.98		150,808 05	
957,170	20.43		195,524 01	
32,789	11.57		3,793 31	
173,155	9.25		16,016 84	
831,773	15.80		132,077 66	
498,425	17.60		87,733 80	
237,676	20.86		49,582 93	
212,994	28.26		60,208 07	
7,906,333	20.84		$1,647,978 36	
EXCA	VATION	Cost Clearing	Total Cost	
Cubic Yards	Cost			
890,287	$ 82,692 16	$ 25,559 20	$ 107,251 36	
Cubic Yards	Cost			
277,904	$ 53,854 44			

APPENDIX A. STATEMENT

The Board of State Engineers is indebted to the courtesy of Captain
following statement of levees built and enlarged by
Arkansas and Louisiana, from

NAME OF CONTRACT	PARISH	DATE OF		LINEAR FEET	
		Contract	Final Certificate	New Levee	Enlargement
IN ARKANSAS.					
2252 to 2533	Chicot Co.	Sep. 13, 1902	Mar. 17, '04	.....	28,100
3950 to 4080	" "	Oct. 20, 1902	Mar. 16, '03	.....	13,000
4080 to 4210	" "	Sep. 25, 1902	Dec., 1903	.....	13,000
2087 to 2121	" "	Sep. 1, 1903	Feb., 1904	3,400	.....
2121 to 2164	" "	Apr. 28, 1903	Oct., 1903	4,300	.....
0 to 62 plus 50	" "	Sep. 23, 1903	Feb. 10, 1904	6,250	.....
2170 to 2185	" "	Sep. 23, 1903	Feb. 10, 1904	1,500	.....
Totals				15,450 or 2.92 mls	54,100 or 10.24 m
IN LOUISIANA.					
190 to 256	E. Carrol	Oct. 20, 1903	.....	.....	6,600
0 to 120	"	Apr. 29, 1903	Feb., 1904	.....	12,000
120 to 190	"	Apr. 28, 1903	Nov., 1903	.....	7,000
Totals				.....	25,600 or 4.85 mls

No. 16. UNITED STATES LEVEES.

E. W. Von Lucas, Corps of Engineers, United States Army, for the the United States, in the Upper Tensas District, in April 21, 1902, to April 20, 1904.

Cubic Yards	Price—Cents	Cost	STREAM	REMARKS
142,992	21½	$ 30,743 29	Mississippi Riv..	
82,639	16.	13,222 24	" " ..	
99,360	19.7	19,573 92	" " ..	
141,145	15.7	22,159 76	" " ..	
145,589	16.	23,294 24	" " ..	
180,852	19.35	34,994 86	" " ..	Leland Spur $25,000.00, paid by Tensas Basin Levee Board.
29,431	17.25	5,076 89	" " ..	
822,008	.....	$ 149,065 20		
.....	.....	.....		
69,718	17.48	$ 12,186 71	Mississippi Riv..	Completed, except slashing
107,157	19.74	21,152 79	" " ..	
76,969	17.25	13,277 15	" " ..	
253,844	.....	$ 46,616 65		
.....	.....	.....		

APPENDIX A. STATEMENT No. 17.

UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Capt. Charles S. Bromwell, Corps of Engineers U. S. Army, for the following statement of levees built and enlarged by the United States, in the Fourth District, improving Mississipsi river from opposite Warrenton, Miss., to head of Passes, from April 20, 1902 to April 20, 1904.

FIFTH LOUISIANA LEVEE DISTRICT.

Name of Levee.	Miles below Cairo.	Length of line.	New or Enlgt.	Date of Completion	Cubic Yardage.	Cost.
Elk Ridge—						
Section 1	630 R	900	Enlgt.	Feb. 8, 1904	12,881.48 $	3,186.88
Section 2	630 R	900	Enlgt.	Feb. 25, 1904	12,527.32	3,099.26
Section 3	630 R	900	Enlgt.	Feb. 25, 1904	12,100.00	2,993.54
Section 4	630 R	900	Enlgt.	Feb. 25, 1904	13,347.90	3,302.27
Section 5	630 R	800	Enlgt.	Feb. 25, 1904	13,371.58	3,308.13
Section 6	630 R	800	Enlgt.	Feb. 8, 1904	12,507.38	3,094.33
White Oak Lake, Lot 1						
Section 1	630 R	800	Enlgt.	Jan. 22, 1904	12,343.89	3,053.88
Section 2	630 R	900	Enlgt.	Jan 29, 1904	13,463.18	3,330.79
Section 3	630 R	1000	Enlgt	Feb. 3, 1904	13,251.46	3,278.41
Section 4	630 R	900	Enlgt.	Dec 30, 1903	12,036.53	2,977.83
Section 5	631 R	800	Enlgt.	Dec 23, 1903	11,786.85	2,916.07
Section 6	631 R	800	Enlgt.	Dec 23, 1903	12,801.56	3,167.11
White Oak Lake, Lot 2						
Section 1	631 R	800	Enlgt.	Dec 16, 1903	13,256.00	3,279.53
Section 2	631 R	800	Enlgt.	Dec 16, 1903	12,688.82	3,139.21
Section 3	631 R	800	Enlgt	Dec 2, 1903	13,583.62	3,360.59
Section 4	631 R	800	Enlgt			
Section 5	631 R	800	Enlgt.			
Section 6	631 R	800	Enlgt.	Apl 5, 1904	11,566.84	2,861.64
White Oak Lake, Lot 3						
Section 1	632 R	800	Enlgt.	Mch 30, 1904	11,864.02	2,935.16
Section 2	632 R	800	Enlgt	Apl 5, 1904	11,961.90	2,959.37
Section 3	632 R	900	Enlgt.	Feb 5, 1904	12,837.30	3,175.95
Section 4	632 R	1000	Enlgt	Jan 22, 1904	13,069.19	3,233.32
Section 5	632 R	1000	Enlgt.	Dec 20, 1903	13,600.43	3,364.75
Section 6	633 R	900	Enlgt.	Dec 2, 1903	12,500.99	3,092.74
Scotland						
Section 1	633 R	900	Enlgt.	Oct 17, 1903	12,370.78	3,060.53
Section 2	633 R	900	Enlgt	Oct 17, 1903	12,715.88	3,145.91
Section 3	633 R	900	Enlgt	Sep 24, 1903	12,872.47	3,184.65
Section 4	633 R	900	Enlgt	Sep 1, 1903	12,348.90	3,055.12
Section 5	633 R	1000	Enlgt	Sep 24, 1903	12,696.34	3,141.07
Section 6	633 R	684	Enlgt.	Sep 24, 1903	10,976.57	2,715.60
Cane Ridge						
Section 1	683 R	835	Enlgt	Nov 10, 1902	12,104.69	2,541.99
Section 2	683 R	900	Enlgt	Dec 10, 1902	13,465.57	2,827.77
Section 3	683 R	600	Enlgt	Jan 20, 1903	10,467.02	2,198.07
Section 4	683 R	600	Enlgt	Mch 2, 1903	10,821.99	2,274.72
Section 5	683 R	700	Enlgt	Mch 2, 1903	11,841.24	2,406.66
Section 6	683 R	500	Enlgt	Nov 22, 1902	11,263.75	2,365.38

FIFTH LOUISIANA LEVEE DISTRICT.— Continued.

Name of Levee.	Miles below Cairo.	Length of line.	New or Enlgt.	Date of Completion.	Cubic Yardage.	Cost.
Shamrock—						
Section 1....	684-R	500	Enlgt.	Nov. 10, 1902	10,661.96	2,239.02
Section 2....	684-R	500	Enlgt.	Nov. 12, 1902	10,826.03	2,273.46
Section 3....	684-R	700	Enlgt.	Dec. 9, 1902	12,076.16	2,535.99
Section 4....	684-R	700	Enlgt.	Dec. 24, 1902	11,823.49	2,482.93
Section 5....	684-R	700	Enlgt.	Mch. 4, 1903	11,437.45	2,401.87
Section 6....	684-R	1000	Enlgt.	Jan. 20, 1903	12,769.13	2,681.52
Vancluse—						
Section 1....	685-R	1000	Enlgt.	Jan. 19, 1903	11,995.38	1,858.08
Section 2....	685-R	900	Enlgt.	Jan. 19, 1903	11,378.99	1,762.61
Section 3....	685-R	900	Enlgt.	Dec. 10, 1902	11,609.30	1,797.28
Section 4....	685-R	1100	Enlgt.	Nov. 27, 1902	12,145.70	1,881.36
Section 5....	685-R	900	Enlgt.	Oct. 30, 1902	11,072.18	1,715.08
Section 6....	685-R	919	Enlgt.	Oct. 2, 1902	11,740.99	1,818.67
Vancluse	685-R	500	New	Jun. 30, 1903	7,459.13	1,154.67
Roseland—						
Section 1....	730-R	1456	Enlgt.	Mch. 7, 1903	12,222.82	1,405.62
Section 2....	730-R	1300	Enlgt.	Mch. 4, 1903	13,055.84	1,501.42
Section 3....	730-R	1300	Enlgt.	Jan. 17, 1903	12,120.23	1,393.82
Section 4....	730-R	1400	Enlgt.	Feb. 10, 1903	12,653.55	1,455.15
Section 5....	730-R	1300	Enlgt.	Jun. 6, 1903	11,993.39	1,379.24
Section 6....	731-R	1400	Enlgt.	Jun. 10, 1903	12,665.94	1,456.58
Section 7....	731-R	1700	Enlgt.	Feb. 10, 1903	13,665.81	1,571.56
Excelsior—						
Section 1....	732-R	1600	Enlgt.	Dec. 21, 1902	11,932.62	1,372.25
Section 2....	732-R	1400	Enlgt.	Oct. 29, 1902	11,584.20	1,332.18
Section 3....	732-R	1500	Enlgt.	Jan. 17, 1903	12,611.77	1,450.35
Section 4....	732-R	1600	Enlgt.	Mch. 4, 1903	12,463.72	1,433.35
Section 5....	732-R	1100	Enlgt.	Mch. 12, 1903	11,591.33	1,333.00
Section 6....	733-R	1200	Enlgt.	Dec. 21, 1902	12,541.26	1,442.24
Section 7....	733-R	1440	Enlgt.	Nov. 1, 1902	12,894.73	1,482.89
Wildwood—						
Section 1....	735-R	1360	Enlgt.	Nov. 28, 1903	14,941.02	1,897.51
Section 2....	735-R	1100	Enlgt.	Jan. 4, 1903	11,503.97	1,461.00
Section 3....	735-R	1400	Enlgt.	Dec. 29, 1903	12,743.58	1,618.43
Section 4....	735-R	1300	Enlgt.	Apl. 25, 1903	12,487.27	1,385.89
Section 5....	735-R	1300	Enlgt.	Apl. 25, 1903	12,781.89	1,623.30
Section 6....	735-R	1300	Enlgt.	Mch. 3, 1904	17,579.53	2,232.60
Home Place—						
Section 1....	736-R	1200	Enlgt.	Dec. 21, 1902	12,681.02	1,458.31
Section 2....	736-R	700	Enlgt.	Nov. 30, 1902	12,721.75	1,463.00
Section 3....	736-R	1000	Enlgt.	Oct. 24, 1902	11,968.56	1,376.38
Section 4....	736-R	800	Enlgt.	Feb. 12, 1903	13,249.46	1,513.88
Section 5....	736-R	900	Enlgt.	Jun. 30, 1903	13,354.62	1,525.78
Section 6....	736-R	1268	Enlgt.	Mch. 14, 1903	13,920.97	1,600.91
Ashland—						
Section 1....	738-R	979	Enlgt.	Oct. 29, 1902	11,089.19	1,275.25
Section 2....	738-R	1100	Enlgt.	Nov. 27, 1902	12,004.29	1,380.49
Section 3....	738-R	1100	Enlgt.	Dec. 2, 1902	12,140.16	1,396.12
Section 4....	738-R	1300	Enlgt.	Dec. 10, 1902	10,424.21	1,198.78
Section 5....	838-R	1000	Enlgt.	Oct. 23, 1902	11,206.64	1,288.76
				Totals	961,084.67	$174,336.81

PONTCHARTRAIN LEVEE DISTRICT.—Continued.

Name of Levee.	Miles below Cairo.	Length of line.	New or Enlgt.	Date of Completion.	Cubic Yardage.	Cost.
Como—						
Section 1....	902-L	778	New	Aug. 31, 1903	13,430.91	1,746.02
Section 2....	902-L	612	New	Aug. 31, 1903	12,326.43	1,602.44
Convent—						
Section 1....	903-L	1300	Enlgt.	Oct. 28, 1903	12,734.10	1,776.41
Section 2....	903-L	1200	Enlgt.	Jan. 10, 1904	11,571.07	1,614.16
Section 3....	903-L	1200	Enlgt.	Dec. 24, 1903	12,233.59	1,706.58
Section 4....	903-L	1200	Enlgt.	Sep. 26, 1903	12,231.24	1,706.26
Section 5....	903-L	1253	Enlgt.	Nov. 4, 1903	11,768.97	1,641.77
Thibodaux—						
Section 1....	903.5-L	542	New	Sep. 2, 1903	13,532.01	1,887.71
Section 2....	903.5-L	516	New	Sep. 2, 1903	12,127.53	1,691.79
College Point—						
Section 1....	904-L	1200	Enlgt.	Oct. 3, 1903	11,078.29	1,545.42
Section 2....	904-L	1400	Enlgt.	Dec. 14, 1903	12,977.73	1,810.39
Section 3....	904-L	1200	Enlgt.	Jan. 14, 1904	11,057.77	1,542.56
Poche—						
Section 1....	911-L	1298	Enlgt.	Aug. 4, 1903	10,127.63	1,288.23
Section 2....	911-L	1300	Enlgt.	Sep. 7, 1903	10,496.44	1,335.15
Section 3....	911-L	1300	Enlgt.	Sep. 24, 1903	10,428.51	1,326.51
Section 4....	911-L	1466	Enlgt.	Aug. 7, 1903	9,873.64	1,255.93
St. Joseph Church—						
Section 1....	912-L	1534	Enlgt.	Nov. 3, 1903	11,857.13	1,508.23
Section 2....	912-L	1100	Enlgt.	Dec. 8, 1903	11,833.31	1,505.19
Section 3....	912-L	700	New	Jan. 8, 1904	12,528.59	1,593.63
Section 4....	912-L	600	New	Feb. 17, 1904	11,366.49	1,445.81
Section 5....	912-L	1180	Enlgt.	Nov. 4, 1903	11,374.11	1,446.78
Golden Grove—						
Section 1....	914.5-L	1200	Enlgt.	Sep. 6, 1902	10,778.93	1,428.21
Section 2....	914.5-L	1200	Enlgt.	Jan. 3, 1902	10,778.26	1,430.77
Section 3....	914.5-L	1200	Enlgt.	Sep. 24, 1902	10,423.52	1,381.11
Section 4....	914.5-L	1200	Enlgt.	Oct. 2, 1902	10,628.11	1,408.23
Section 5....	914.5-L	1200	Enlgt.	Oct. 10, 1902	10,632.03	1,408.74
Sport—						
Section 1....	915-L	1100	Enlgt.	Oct. 31, 1902	10,426.67	1,381.53
Section 2....	915-L	1200	Enlgt.	Nov. 15, 1902	10,103.08	1,338.66
Section 3....	915-L	1000	Enlgt.	Nov. 15, 1902	10,120.39	1,340.95
Section 4....	915-L	1000	Enlgt.	Nov. 29, 1902	10,531.45	1,395.42
Section 5....	915-L	1000	Enlgt.	Dec. 13, 1902	11,076.66	1,467.66
Mt. Airy—						
Section 1....	916-L	900	Enlgt.	Dec. 23, 1902	9,680.38	1,282.65
Section 2....	916-L	1100	Enlgt.	Dec. 30, 1902	11,218.20	1,486.41
Section 3....	916-L	800	Enlgt.	Jun. 3, 1903	10,000.56	1,325.07
Section 4....	916-L	800	Enlgt.	Jun. 3, 1903	10,189.75	1,380.44
Section 5....	916-L	800	Enlgt.	Jun. 3, 1903	10,461.44	1,386.15
Laplace—						
Section 1....	927-L	1800	Enlgt.	Dec. 16, 1903	13,174.87	1,675.84
Section 2....	927-L	1800	Enlgt.	Oct. 31, 1903	11,738.02	1,493.08
Section 3....	927-L	2000	Enlgt.	Feb. 3, 1904	12,820.62	1,630.78
Section 4....	927-L	2100	Enlgt.	Meh. 15, 1904	13,051.82	1,660.10
Section 5....	927-L	2190	Enlgt.	Sep. 19, 1903	11,199.63	1,424.59
Belmont—						
Section 4....	908-L	1100	Enlgt.	Apl. 4, 1904	14,289.97	2,485.29
Hester—						
Section 3....	909-L	1400	Enlgt.	Apl. 5, 1904	11,135.51	2,054.50
				Totals	1,044,358.86	$140,288.95

LAKE BORGNE DISTRICT.

Name of Levee.	Miles below Cairo.	Length of line.	New or Enlgt.	Date of Completion.	Cubic Yardage.	Cost.
Scarsdale—						
Section 1....	985-L	700	New	Oct. 23, 1902	11,917.12	$ 1,817.36
Section 2....	985-L	800	New	Sep. 29, 1902	13,674.58	2,085.38
Section 3....	985-L	836	New	Sep. 4, 1902	13,683.43	2,086.73
Savoie—						
Section 1....	1008-L	2900	Enlgt.	Aug. 27, 1902	13,550.20	1,930.90
Section 2....	1008-L	2754	Enlgt.	Oct. 6, 1902	13,601.31	1,938.19
				Totals	66,426.64	$ 9,858.56

GRAND PRAIRIE LEVEE DISTRICT.

Louderbough—						
Section 1....	1024-L	1938	New	Dec. 23, 1903	14,409.02	$ 2,545.59
Section 2....	1024-L	2250	New	Dec. 23, 1903	14,951.15	2,641.37
Section 3....	1024-L	1564	New	Dec. 23, 1903	14,273.17	2,521.49
				Totals	43,633.34	$ 7,708.55

APPENDIX A. STATEMENT

RECAPITULATION

DISTRICTS	MILES	
	New Levee	Enlargement
In Arkansas	2.92	10.24
In Louisiana—		
Fifth Louisiana — Upper Tensas	.....	4.85
Fifth Louisiana — Lower Tensas	0.10	14.89
Atchafalaya Basin	0.48	1.76
Pontchartrain	0.71	17.88
Lafourche Basin	.....	4.29
Lake Borgne	0.44	1.07
Grand Prairie	1.09	.....
Buras	0.48	.....
Totals	6.22	54.98

No. 18. UNITED STATES LEVEES.

Cubic Yards	Cost	REMARKS
822,008	$149,065 20	
253,844	46,616 65	
961,085	174,336 81	
141,594	21,542 94	
1,044,359	140,288 95	
185,631	28,191 05	
66,427	9,858 56	
43,633	7,708 55	
17,120	2,824 79	
3,535,701	$580,433 50	

APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several levee dis-
April 21, 1902, to April 20, 1904, by the District, State and

NAME OF DISTRICT	BY WHOM DONE	ILES OF New Levee	ILES OF Enlargement
Arkansas	Tensas Basin Levee District	.....	4.17
	United States	2.92	10.24
	Totals	2.92	14.41
In Louisiana— Fifth Louisiana Levee District	District	7.54	28.89
	State	10.42	9.53
	United States Up Tensas	.....	4.85
	United States Lr Tensas	0.10	14.89
	Totals	18.06	58.16
Atchafalaya Basin Levee District	District	9.33	13.31
	State	0.72	4.97
	United States	0.48	1.76
	Totals	10.53	20.04
Pontchartrain Levee District	District	2.30	19.11
	State	1.16	.....
	United States	0.71	17.88
	Totals	4.17	36.99
Lafourche Basin Levee District	District	4.23	10.94
	State	0.47	5.02
	United States	.....	4.29
	Totals	4.70	20.25
Orleans Levee District	District	0.28	3.39
	Totals	0.28	3.39
Lake Borgne Levee District	State	0.27	2.76
	United States	0.44	1.07
	Totals	0.71	3.83
Grand Prairie Levee District	District	2.66	0.14
	State	4.46	3.14
	United States	1.09	.....
	Totals	8.21	3.28
Buras Levee District	State	1.28	0.97
	United States	0.48	.....
	Totals	1.76	0.97
Plaquemines Parish East Bank Levee Dist.	District	6.75	.....
	Totals	6.75	.....

No. 19. SUMMARY ACCORDING TO DISTRICTS.

tricts of Louisiana, and in Desha and Chicot counties, Arkansas, from United States, as shown in the foregoing statements.

Cubic Yards	Average price per cubic yard—Cents	COST	REMARKS
309,156	28.16	$96,715 16	
822,008		149,065 20	
1,131,164		$245,780 36	
2,313,912	23.38	$540,945 25	
827,447	14.95	123,769 01	
253,844		46,616 65	
961,085		174,335 81	
4,356,288		$885,667 72	
1,544,697	20.36	$314,573 28	
325,960	16.03	52,263 77	
141,594		21,542 94	
2,012,251		$388,379 99	
794,586	18.98	$150,808 05	
269,139	18.50	49,790 71	
1,044,359		140,288 95	
2,108,084		$340,887 71	
957,170	20 43	$195,524 01	
143,394	27.56	39,525 39	
185,631		28,191 05	
1,286,195		$263,240 45	
212,994	28.26	60,208 07	
212,994		$60,208 07	
70,903	17.27	$12,244 45	
66,427		9,858 56	
137,330		$22,103 01	
32,789	11.57	$3,793 31	
109,956	13.56	15,019 90	
43,633		7,708 55	
186,378		$26,521 76	
58,283	17.53	10,216 51	
17,120		2,824 79	
75,40		$13,041 30	
173,155	9.24	$16,016 84	
173,155		$16,016 84	

APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several levee dis- April 21, 1902, to April 20, 1904, by the District, State and

NAME OF DISTRICT	BY WHOM DONE	ILES OF New Levee	ILES OF Enlargement
Arkansas	Tensas Basin Levee District	.....	4.17
	United States	2.92	10.24
	Totals	2.92	14.41
In Louisiana— Fifth Louisiana Levee District	District	7.54	28.89
	State	10.42	9.53
	United States Up Tensas	.....	4.85
	United States Lr Tensas	0.10	14.89
	Totals	18.06	58.16
Atchafalaya Basin Levee District	District	9.33	13.31
	State	0.72	4.97
	United States	0.48	1.76
	Totals	10.53	20.04
Pontchartrain Levee District	District	2.30	19.11
	State	1.16	.....
	United States	0.71	17.88
	Totals	4.17	36.99
Lafourche Basin Levee District	District	4.23	10.94
	State	0.47	5.02
	United States	.....	4.29
	Totals	4.70	20.25
Orleans Levee District	District	0.28	3.39
	Totals	0.28	3.39
Lake Borgne Levee District	State	0.27	2.76
	United States	0.44	1.07
	Totals	0.71	3.83
Grand Prairie Levee District	District	2.66	0.14
	State	4.46	3.14
	United States	1.09	.....
	Totals	8.21	3.28
Buras Levee District	State	1.28	0.97
	United States	0.48	.....
	Totals	1.76	0.97
Plaquemines Parish East Bank Levee Dist.	District	6.75	.....
	Totals	6.75	.....

No. 19. SUMMARY ACCORDING TO DISTRICTS.

tricts of Louisiana, and in Desha and Chicot counties, Arkansas, from United States, as shown in the foregoing statements.

Cubic Yards	Average price per cubic yard—Cents	COST	REMARKS
309,156	28.16	$96,715 16	
822,008		149,065 20	
1,131,164		$245,780 36	
2,313,912	23.38	$540,945 25	
827,447	14.95	123,769 01	
253,844		46,616 65	
961,085		174,335 81	
4,356,288		$885,667 72	
1,544,697	20.36	$314,573 28	
325,960	16.03	52,263 77	
141,594		21,542 94	
2,012,251		$388,379 99	
794,586	18.98	$150,808 05	
269,139	18.50	49,790 71	
1,044,359		140,288 95	
2,108,084		$340,887 71	
957,170	20 43	$195,524 01	
143,394	27.56	39,525 39	
185,631		28,191 05	
1,286,195		$263,240 45	
212,994	28.26	60,208 07	
212,994		$60,208 07	
70,903	17.27	$12,244 45	
66,427		9,858 56	
137,330		$22,103 01	
32,789	11.57	$3,793 31	
109,956	13.56	15,019 90	
43,633		7,708 55	
186,378		$26,521 76	
58,283	17.53	10,216 51	
17,120		2,824 79	
75,40		$13,041 30	
173,155	9.24	$16,016 84	
173,155		$16,016 84	

APPENDIX A. STATEMENT

NAME OF DISTRICT	BY WHOM DONE	MILES	
		New Levee	Enlargement
Caddo Levee District	District	10.50	3.56
	State	2.72	0.02
	Totals	13.22	3.58
Bossier Levee District	District	6.17	.....
	State	3.55	1.00
	Totals	9.72	1.00
Red River, Atchafalaya and Bayou Bœuf Levee District	District	0.91	4.26
	State	0.08	9.18
	Totals	0.99	13.44
RECAPITULATION			
In Arkansas		2.92	14.41
In Louisiana--			
Fifth Louisiana Levee District		18.06	58.16
Atchafalaya Basin Levee District		10.53	20.04
Pontchartrain Levee District		4.17	36.99
Lafourche Basin Levee District		4.70	20.25
Orleans Levee District		0.28	3.39
Lake Borgne Levee District		0.71	3.83
Grand Prairie Levee District		8.21	3.28
Buras Levee District		1.76	0.97
Plaquemines Parish East Bank Levee District		6.75	...
Bossier Levee District		9.72	1.00
Caddo Levee District		13.22	3.58
Red River, Atchafalaya and Bayou Bœuf Levee District		0.99	13.44
Totals		82.02	179.34
By the Districts		50.67	87.77
By the State		25.13	36.59
By the United States		6.22	54.98
Totals		82.02	179.34

No. 19.—Cont'd. SUMMARY ACCORDING TO DISTRICTS.

Cubic Yards	Average price per cubic yard—Cents	COST	REMARKS
831,773	15.80	$132,077 06	
213,025	19.2[illegible]	40,994 71	
1,044,798		$173,072 37	
498,425	17.60	$87,733 8[illegible]	
392,374	15.75	61,813 9[illegible]	
890,799		$149,547 75	
237,676	20.86	$49,582 03	
226,888	19.39	43,981 75	
464,564		$93,564 68	
1,131,164		$245,780 36	
4,356,288		885,667 72	
2,012,251		388,379 99	
2,108,084		340,887 71	
1,286,195		263,240 45	
212,994		60,208 07	
137,330		22,103 01	
186,378		26,521 76	
75,403		13,041 3[illegible]	
173,155		16,016 84	
890,799		149,547 75	
1,044,798		173,072 37	
464,564		93,564 68	
14,079,403		2,678,032 01	
7,906,333		1,647,978 36	
2,637,369		449,620 15	
3,535,701		580,433 50	
14,079,403		2,678,032 01	

APPENDIX A. STATEMENT

Approximate quantities and cost of levee work in the several Levee Dis-
April 21, 1902, to April 20, 1904, by the Districts, State and

STREAM	LEVEE DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Mississippi River in Arkansas	Tensas Basin	District	.....	4.17
		United States	2.92	10.24
		Totals	2.92	14.41
Mississippi River in Louisiana	Fifth Louisiana	District	7.54	28.89
		State	10.42	9.53
		United States	0.10	19.74
	Atchafalaya Basin	District	2.52	12.30
		State	0.72	4.97
		United States	0.48	1.76
	Pontchartrain	District	2.30	19.11
		State	1.16	.....
		United States	0.71	17.88
	Lafourche Basin	District	4.23	9.30
		State	0.47	5.02
		United States	.....	4.29
	Orleans	District	0.28	3.39
	Lake Borgne Basin	State	0.27	2.76
		United States	0.44	1.07
	Grand Prairie	District	2.66	0.14
		State	4.46	3.14
		United States	1.09	.....
	Buras	State	1.28	0.97
		United States	0.48	.....
		Totals	41.61	144.26
Red River	Caddo	District	10.50	3.56
		State	2.72	0.02
	Bossier	District	6.17	.....
		State	3.55	1.00
	R. R. A. and B. B	State	.....	6.28
		Totals	22.94	19.90
Bayou des Glaizes	R. R., A. and B. B.	District	.....	0.63
		State	0.08	2.77
		Totals	0.08	3.40
Atchafalapa River	R. R., A. and B. B.	District	0.91	3.63
	Atchafalaya Basin	District	6.68	0.31
		Totals	7.59	3.94

No. 20. SUMMARY ACCORDING TO STREAMS.

tricts of Louisiana, and in Desha and Chicot counties, Arkansas, from United States, as shown in the foregoing statements.

Cubic Yards	Cost	REMARKS
309,156	$96,715.16	
822,008	149,065.20	
1,131,164	$245,780.36	
2,313,912	$540,945.25	
827,447	123,769.01	
1,214,929	220,953.46	
1,057,873	222,482.22	
325,960	52,263.77	
141,594	21,542.94	
794,586	150,808.05	
269,139	49,790.71	
1,044,359	140,288.95	
892,635	179,642.83	
143,394	39,525.39	
185,631	28,191.05	
212,994	60,208.07	
70,903	12,244.45	
66,427	9,858.56	
32,789	3,793.31	
109,956	15,019.90	
43,633	7,708.55	
58,283	10,216.51	
17,120	2,824.79	
9,823,564	$1,892,077.77	
831,773	$132,077.66	
213,025	40,994.71	
498,425	87,733.80	
392,374	61,813.95	
162,369	32,929.04	
2,097,966	$355,549.16	
15,197	$2,857.03	
61,198	9,458.63	
76,395	$12,315.66	
222,479	$46,725.90	
455,039	86,715.41	
677,518	$133,441.31	

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APPENDIX A. STATEMENT

STREAM	LEVEE DISTRICT	BY WHOM DONE	MILES OF New Levee	MILES OF Enlargement
Bayou Lafourche	Atchafalaya Basin	District	0.13	0.70
	Lafourche Basin	District	.....	1.64
		Totals	0.13	2.34
Bayou Rapides	R. R., A. and B. B.	State	.....	0.13
Gulf Coast	Plaquemines Parish East Bank	District	6.75	.....

RECAPITULATION.

Mississippi River (in Arkansas)	2.92	14.41
Mississippi River (in Loufsiana)	41.61	144.26
Red River	22.94	10.86
Bayou des Glaizes	0.08	3.40
Atchafalaya River	7.59	3.94
Bayou Lafourche	0.13	2.34
Bayou Rapides	.....	0.13
Gulf Coast	6.75	.....
Totals	82.02	179.34

No. 20.—Cont'd. SUMMARY ACCORDING TO STREAMS.

Cubic Yards	Cost	REMARKS
31,785	$5,375.65	
64,535	15,881.18	
96,320	$21,256.83	
3,321	$1,594.08	
173,155	$16,016.84	
1,131,164	$245,780.36	
9,823,564	1,892,077.77	
2,097,966	355,549.16	
76,395	12,315.66	
677,518	133,441.31	
96,320	21,256.83	
3,321	1,594.08	
173,155	16,016.84	
14,079,403	$2,678,032.01	

APPENDIX A. STATEMENT

GRAND

DISTRICT	MILES	
	New Levee	Enlargement
	LEVEE	
Districts	50.67	87.77
State	25.13	35.59
United States	6.22	54.98
Totals	82.02	179.34
	DRAIN	
	MILES	
	Excavation	Clearing
Districts	30.01	22.54
	IMPROVING	
	MILES	
	New Levee	Excavation
Districts	0.08	14.50

No. 21. SUMMARY.

TOTAL,

Cu. Yards	Cost		Total Cost	Remarks
WORK				
7,906,333	$1,647,978.36			
2,637,369	449,620.15			
3,535,701	580,433.50			
14,079,403	$2,678,032.01		$2,678,032.01	
AGE				
EXCAVATION		Cost Clearing		
Cu. Yrads	Cost			
890,287	$ 82,692.16	25,559.20	107,251.36	
BAYOU LAFOURCHE				
Cu. Yards	Cost			
277,904	$ 53,854.44		53,854.44	
		Total ...	$2,839,137.81	

APPENDIX B.

COPIES OF SUNDRY SPECIAL REPORTS, ETC., FROM THE BOARD OF STATE ENGINEERS TO THE VARIOUS LEVEE BOARDS, AND TO OTHERS. ALSO STATEMENTS RELATIVE TO RESOURCES OF THE LEVEE DISTRICTS AND STATE FOR LEVEE PURPOSES, AND RELATIVE TO LENGTH OF LEVEE LINES AND HIGH WATER RECORDS.

APPENDIX B.

Sundry Special Reports to Commissioners.

STATE OF LOUISIANA,
Office Board of State Engineers,
New Orleans, La., Sept. 19, 1902.

Hon. J. Q. Graves, Prest., and Members Board of Commissioners, Tensas Basin Levee District, Monroe, La.

Gentlemen: In accordance with the request of the Police Jury of Caldwell Parish, of July 16, 1902, and your resolution of July 29th, that the Board of State Engineers be requested to have Sandy Bayou surveyed and ascertain what the cost of building a dike over it near the present location of your old dike at the road crossing to Columbia would be, and report same to your Board, I have the honor to submit the following report:

The work was surveyed under the direction of this office, on September 5th, and a sketch map of the survey is enclosed herewith. I also beg leave to submit a report from Mr. Selman on the subject, and to state that we have had cross-sections made and quantities computed. We find that on a basis of 24-ft. crown and 2½ to 1 side slopes this dike will contain 15,856 cubic yards, and will be 330 feet in length. Placing its cost at a reasonable price, say 15 cents per cubic yard, it will amount to $2,378 for the embankment.

Under the act creating your Board, you have a right to build levees for protection from overflow and as this bayou is connected with the Ouachita River at present, a considerable quantity of water escapes through it and no doubt aids in increasing the water in Bœuf River at high water in the Ouachita, and a dike would be of benefit to considerable lands and protect same from overflow from the Ouachita even when the river is not above a bank full stage.

I would, therefore, recommend that if a price within a reasonable limit can be obtained for the work, that the Police Jury of Caldwell Parish and your Board proceed to dike it on the section as recommended. A width of crown of 24 feet would be equal to a banquette and an ordinary crown of 8 feet. If you desire the

construction notes for the work will be issued to whatever contractor obtains the work, and a regular contract such as is used for all levee work can be drawn up, and the Police Jury of Caldwell Parish and your Board can agree to pay so much towards the construction of the dike. The figures upon which the quantities are estimated are based on actual survey and stakes have been set throughout the whole length of the dike, so that no further survey is necessary for the work.

I would imagine, however, that a just proportion should be borne by the Police Jury of Caldwell Parish say not less than one-half and that they give your Board some guaranty as to the maintenance of the dike after its completion. It would be better to pass a resolution aiding the Police Jury of Caldwell Parish in the construction of the dike than undertaking it as your work, as Act No. 108 of the General Assembly of 1898 makes riding, driving, or hauling on the public levees of the State a misdemeanor, and you have no authority to go beyond the Act in permitting the use of any dike for a public road, when it is built by your Board.

Very respectfully,

M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, April 12th, 1904.

To the President and Members of the Tensas Basin Levee Board.

GENTLEMEN: The following works have been completed by your Board within the last season, and amounts expended thereon:

Repair Lucca Loop and Opossum Fork Loop..	$ 1,896.00
Repair Panther Forest.....	2,982.00
Repair Vaucluse	2,016.00
Repair Gaines to Panther Forest.....	2,736.00
Spur Levee Leland Neck.....	25,000.00
Fulton Lake	62,085.16
	$96,715.16

These works have cost the Board the total sum of $96,715.16, and have resulted in greatly bettering the condition of the levee line upon which the Tensas Basin Levee Board is immediately dependent for protection.

The repair of Lucca Loop and Opossum Fork Loop consisted of restoration of weather wash and re-sodding. The repair of Panther Forest Short Line consisted of the excavation of a defective foundation and the refilling of same with good material, where the levee gave a great deal of trouble in 1903. The Vaucluse repair was of the same nature as that at Panther Forest. The repair of Gaines Landing to Panther Forest consisted in the topping, general repairing and overhauling of this important line of levee extending from Gaines Landing to Panther Forest Short Line. The Spur Levee at Leland Neck consisted in the construction of a spur dike on the river side of the levee out on the Leland Neck, and was for the purpose of preventing a cut-off that was imminently threatened. The Fulton Lake work consisted in river side enlargement of more than 4 miles of the important Fulton Lake levee, up to a grade four feet above the high water of 1897.

Your Board is to be congratulated upon the expedition with which all these works have been accomplished, and especially of the two works, Fulton Lake and Leland Spur.

The Fulton Lake levee has always been a source of anxiety to the people of the Tensas Basin, and we have been very fortunate in being able to put an enlargement throughout its entire length on the river side. This has been accomplished by the proper drainage of the pits and the remarkably dry season we have just passed. I hope that for the future the Fulton Lake Levee will cease to be a bug-bear to the people of the Tensas Basin, and I believe that we have now made it one of the best levees in the district.

The construction of the Leland Spur dike and the revetment of its end, by the United States Government, by the placing of mattresses and stone, will, no doubt, make this work hold, and thereby prevent that which was threatened, to-wit: a cut-off opposite the town of Greenville.

I congratulate the Board upon the hopeful outlook at present as regards high water, as it is not probable that the levees on this rise will be subjected to a severe test. I am also pleased to inform you that Capt. Lucas has retained asufficient amount of money for the purpose of putting the necessary inspectors, boats, and material in the Upper Tensas District in Arkansas, and that he is ready, should an emergency occur, to make a vigorous high water fight on the Arkansas levees. He did not state to me exactly the amount in hand, but from what he said I would infer that he has sufficient to meet the immediate needs.

At this time it is not necessary to make a project for future work in the Upper Tensas District in Arkansas, but it is reasonable to suppose that the work that is most important to you will be the construction of the two small loops at Chicot and Middle Places. These small loops will aggregate about 90,000 cubic yards, and I hope to see the Government undertake their construction. I believe that the Panther Forest Short Line may need a small loop this season, but these matters can be better taken up at a later date.

I congratulate your Board upon the zeal which it has always manifested in levee matters.

Respectfully,
M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 10, 1903.

Hon. A. H. Gay, Prest. Board of Commissioners, Atchafalaya Basin Levee District, Plaquemine, La.

DEAR SIR: In order to comply with the resolution passed by the Atchafalaya Basin Levee Board at its last meeting, regarding the drainage of levees, I beg to submit the following, which is illustrated by the accompanying blue print:

First. A ditch should be dug parallel with the base of the levee, not nearer than three (3) feet from said base, which shall be two (2) feet wide at the top, one (1) foot wide at the bottom, and not deeper than eighteen (18) inches. This ditch should extend continuously along the entire levee line, and is intended to gather the seepage water coming through the levee and its base.

Second. On the opposite side of the road, which is the side furthest from the levee, another ditch should be dug, about three and a half (3½) feet wide at top, one (1) foot wide at the bottom, and not less than two and a half (2½) feet deep.

Third. At intervals not exceeding five hundred feet apart, and selected in the lowest depressions of the ground, a transversal ditch should be cut, connecting the near or base ditch, with the far or road ditch, so that the water from the base ditch might be carried into the far and deeper road ditch. These cross ditches should be not less than three (3) feet wide at the bottom, with slopes of one-half (½) horizontal to one (1) vertical; and should be covered with bridges so as to allow traffic over them.

Fourth. At suitable points and wherever the topography of the country develops a low place, the far road ditch must be drained back through the fields into the general plantation or land drains.

The object of the first ditch is to collect the seepage water from the base of the levee, and carry it through the transveral ditch into the far road ditch. The object of the deeper road ditch is to drain the general sub-soil and to pour this sub-soil seepage into the plantation ditches and drains to be carried by them away from the levee.

The base or near ditch should not be dug nearer than the three (3) feet mentioned; nor deeper than the eighteen (18) inches mentioned, as it would weaken the levee should it exceed these dimensions.

Should this work be done thoroughly and continuously, the levees will be able to stand the highest water against them without developing any soft places, and without any sloughing of the levee, which is one of the most dangerous features to combat in high water.

In the accompanying diagram, the ditch "A" outlines the nearer base ditch, the ditch "B' indicates the far or road ditch, and the ditch "C" outlines the transversal connecting ditches to be covered by bridges, while the ditch "D" outlines the plantation drain.

Very respectfully submitted,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 25, 1903.

Hon. A. H. Gay, Prest. Atchafalaya Basin Levee District, Plaquemine, La.

MY DEAR MR. GAY: I returned last night from a trip on Bayou Lafourche. I went to the Howell Crevasse, and, day before yesterday, it seemed to be about 240 feet wide. The water from this crevasse seems to flow westward, injuring the Howell and Lagarde plantations and a few small plantations on a back brusle, and then loses itself in the swamp. It will probably put some back water on the Bayou Black plantations in the Parish of Terrebonne.

The crevasse was in the levee immediately in front of Mr. W. E. Howell's house, and was in a piece of levee which had not been enlarged when we did the work in 1899, owing to Mr. Howell's

positive refusal to allow any work to be done there. He threatened to enjoin the Board if it attempted to work on this levee, and, after consultation with Col. Sparks, it was decided to leave that small stretch rather than involve the Board in a law-suit, and to spend that money on other places on Bayou Lafourche which were equally in need of work.

From there I came up the bayou, going over the entire levee line to Donaldsonville. I found a very low piece of levee in front of Mr. Munson's place, and some low levees amounting to about three miles in length from Klotzville up. I have urged Mr. Dugas to immediately begin raising these levees. I consider it of the utmost importance that the work of raising these levees be begun at once, as if it is delayed the water will probably catch us before these levees are raised. The people in the neighborhood seem to be apathetic and disinclined to do any work on their levees until it is necessary. I believe that the water at those points and at Donaldsonville will be one foot higher than the high water of 1897, and I consider it of the utmost importance that the levees which I have mentioned above, viz: the Munson levee, and the low levees above Klotzville should be raised at once in order to avoid disaster. I have told this to Mr. Dugas and am going to write it to him to-day.

I shall again be on the bayou to-morrow or day after, and will go over these stretches of levee, and will do everything in my power to arouse the people to the necessity of the situation at those points.

I hear that on our river line everything is in good condition. As far as I can see, I still retain the same opinion which I had with regard to the height of the water—that we will have somewhat higher water than in 1897. From present outlook I think we should prepare for a foot more water than we had in 1897. With care and vigilance, I see no reason why we should not stand this water on all our line, with the exception of Bayou Lafourche. I shall go on the bayou in the next day or two, and then come up on the river.

With regards, I am,

Very truly yours,

ARSENE PERRILLIAT,
Asistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 19th, 1902.

To the Honorable Board of Commissioners, for the Pontchartrain Levee District.

GENTLEMEN: The Board of State Engineers has prepared, for your information, a detailed statement in regard to the present evondition of the levees throughout your district, and the probable requirements in cubic yards of earth to place said levee line to a grade 4.6 feet above high water of 1897, at Baton Rouge, and 3.3 feet, at Parish line of Jefferson and Orleans, with crown 8 feet and slopes 3 and 3 on 1; and to build new levees where necessary through caving of river bank, or to replace existing old levees too near river bank to be enlarged.

EAST BATON ROUGE PARISH.

Name of Levee.	Sta. to Sta.	Length in feet.	Above H. W. 1897.	Cubic Yds.	Remarks.
	0- 152	15,200	3.5	55,000	Levees about one foot below grade. This stretch requires cleaning and grubbing of small trees, bushes, etc.
Arlington	152- 202	5,315		233,000	New levee to be built by State.
Arlington to Martinez	202- 362	16,200	3.5	60,000	Levees about one foot below grade.
Martinez to Chatsworth ..	362- 590	22,800	4.0	65,000	Levees about ½ foot below grade. Stretch from Conrad Point to upper line of Chatsworth requires cleaning, and grubbing of bushes, small trees, etc.
Chatsworth	590- 691	10,100	3.5	35,000	Levees about one foot below grade.
	691- 737	4,600	4.6		From Burtville to lower line of parish, levees are up to grade, but require cleaning and resodding in spots. All ponds should be drained.
Totals		74,215		448,000	

IBERVILLE PARISH.

Woodstock to Towles	737- 942	20,500	4.4		Levees are up to grade, but require cleaning and resodding in spots.
Towles to Billings	942- 976	3,400	2.2	17,000	Pond should be drained.

Name of Levee.	Sta. to Sta.	Length in feet.	Above H. W. 1897.	Cubic Yds.	Remarks.
Billings to Dupuy	976-1107	13,100	3.3	50,000	Levees about one foot below grade.
Dupuy to Grandada ...	1107-1277	17,000	4.2		
Jolisaint, N. L.	1277-1305	3,000	2.0	90,000	New levee will be required at some future date.
Magnolia to Golden Gate .	1305-1364	5,900	4.2		
Golden Gate to Oakley	1364-1448	8,400	3.2	35,000	
Oakley to Margaret	1448-1507	5,900	2.2	45,000	
Margaret	1507-1534	2,700	3.2	12,000	
Margaret to Edna	1534-1581	4,700	2.4	20,000	
Edna to Thiery.	1581-1623	4,200	1.5	35,000	
Thiery to Ophelia	1623-1665	4,200	4.1		Levees require cleaning.
Ophelia to Lorio.	1665-1738	7,300	1.5	45,000	Levees require cleaning.
Lorio	1738-1748	1,000	4.1		
Lorio to Point Clear..	1748-1764	1,600	1.5	13,000	Levees require cleaning.
Point Clear to Arizona	1764-2043	27,900	4.0		
Arizona to Parish Line...	2043-2145	10,200	2.0	85,000	Levees require cleaning.
Totals		141,000		447,000	

ASCENSION PARISH.

Southwood to Willow Grove.	2145-2492	34,700	2.0	250,000	Levees require cleaning.
Willow Grove...	2492-2510	1,800	3.0	10,000	
Gem to Canty's.	2510-2617	10,700	1.5	90,000	Levees require cleaning and grubbing of small trees, bushes, etc.
Canty to LeBlanc	2617-2685	6,800	1.0	50,000	Levees require cleaning and grubbing of small trees, bushes, etc.
Leblanc to Darrowville .	2685-2755	7,000	2.0	50,000	
Darrowville to Hermitage ...	2755-2772	1,700	1.0	15,000	
Hermitage, N. L.	2772-2819	4,603	0.5	125,000	Caving bank; new levee will be required.
Hermitage	2819-2850	3,100	0.5	25,000	
Hermitage to Riverton	2850-2953	10,300	2.0	50,000	
Riverton	2953-3012	5,900	4.1		
Houmas Res. to Store	3012-3042	3,000	2.0	15,000	
Houmas Store to Parish Line..	3042-3140	9,800	4.0		
Totals		99,403		680,000	

ST. JAMES PARISH.

Name of Levee.	Sta. to Sta.	Length in feet.	Above H. W. 1897.	Cubic Yds.	Remarks.
Parish Line to St. Mary Chapel	3140-3266	12,600	2.0	75,000	
St. Mary Chapel	3266-3290	2,400			Under contract by U. S.
to Alta Villa	3290-3341	5,100			Advertised by U. S.
Alta Villa to St. Rose	3341-3448	10,700	1.0	100,000	
St. Rose, N. L.	3448-3474	2,400	1.0	75,000	Levee too near to be enlarged.
Nita	3474-3519	4,500	2.0	30,000	
Celestine, N. L.	3519-3544	2,400	1.5	75,000	Caving bank; new levee will be required at some future date.
Lilly	3544-3578	3,400	2.5	19,000	
Uncle Sam to St. Michael Ch.	3578-3685	10,700	1.5	90,000	
St. Michael Church to Cent. Store	3685-3716	3,300	1.5	76,000	New levee too near river bank to be enlarged.
Cent. Store to Oneida Store	3716-3890	17,400	2.0	145,000	
Oneida, N. L.	3890-3915	2,600	2.0	75,000	Levee too near river bank to be enlarged.
Belmont to S. Elmo	3915-4040	12,500	1.5	150,000	
St. Elmo	4040-4110	7,000	2.0	35,000	
Bellevue to Parish Line	4110-4358	24,800	1.5	150,000	
Totals		121,800		1,095.000	

ST. JOHN PARISH.

Parish Line to Angelina	4358-4416	5,800	2.5	45,000	
Angelina	4416-4443	2,700	0.5	30,000	
New Hope, N. L.	4443-4489	5,000	1.5	190,000	Caving bank; new levee will be required.
Hope	4489-4531	4,200	1.5	25,000	
Hope to Terrehaute	4531-4610	7,900	2.0	32,000	
Terrehaute to Cornland	4610-4740	13,000	1.0	65,000	
Cornland	4740-4766	2,600	2.0	13,000	
Cornland to Belle Point	4766-4841	7,500	1.5	35,000	
Belle Point to Louque	4841-5005	16,400	1.5	92,000	
Louque	5005-5027	2,000	2.0	70,000	Probable new levee.
Bonnet Carre to Parish Line	5027-5142	11,500	3.0	50,000	
Totals		78,600		647,000	

St. Charles Parish.

Name of Levee.	Sta. to Sta.	Length in feet.	Above H. W. 1897.	Cubic Yds.	Remarks.
Anchor	5142-5205	6,300	1.5	40,000	
Gypsy to Diamond	5205-5363	15,800	2.0	482,000	
Diamond	5363-5396	3,500	2.0	90,000	Probable new levee.
Diamond to Good Hope	5396-5434	3,800	1.0	37,000	
Prospect	5434-5517	8,300	2.0	35,000	
Sarpy	5517-5545	2,800	1.5	30,000	
Victoria	5545-5601	5,600	2.0	45,000	
Red Church	5601-5664	6,300	2.0	22,000	
Destrehan	5664-5734	7,000	1.5	32,000	
Modoc-Elkinsville	5734-5840	10,600	3.7		
St. Rose	5840-5913	7,300	1.0	40,000	
Almedia	5913-5959	4,600	2.0	20,000	
Upper Fairview	5959-5980	3,100	3.7		
Fairview, N. L.	5980-5992	1,500		50,000	Probable new levee.
Lower Fairview	5992-6024	3,200	2.0	20,000	
Totals		89,700		943,000	

Jefferson Parish.

Parish Line to Hanson City	6024-6062	3,800	1.5	15,000	
Hanson City	6062-6077	1,500	3.5		
Hanson City to Trudeau	6077-6186	10,900	1.5	50,000	
Sauve	6186-6237	5,100	3.5		
Sauve to Boisblanc	6237-6271	4,000	1.5	160,000	Probable new levee.
Boisblanc	6271-6291	2,000	1.5	12,000	
Perkins	6291-6321	3,100	2.0	60,000	Probable new levee.
Tchoupitoulas	6321-6384	6,300	1.5	30,000	
Soniat Lower	6384-6394	1,000	3.4		
So. University	6394-6419	2,500	1.0	12,000	
Lafreniere	6419-6437	1,800	3.3		
Elmwood	6437-6519	8,200	1.5	35,000	
White Hall to Southport	6519-6560	4,100	3.3		
Southport Bend	6560-6608	4,800	3.3	108,000	Probable new levee in the bend.
Totals		59,100		482,000	

RECAPITULATION.

Recapitulation by Parishes, Showing Height of Levees Above H. W. of 1897.

Lengths of stretches given in linear feet.

Parish.	Height above High Water 1897. 0 to 1 feet above.	1 to 2 feet above.	2 to 3 feet above.	3 feet above to grade.	Total length of Levee Line in Parish.
East Baton Rouge— 0 to 737.....				74,215	74,215
Iberville Parish— 737 to 2145.....		13,100	27,200	100,700	141,000
Ascension— 2145 to 3140....	16,203	65,700	1,800	15,700	99,403
St. James— 3140 to 4358....	13,100	97,800	3,400	7,500	121,800
St. John Parish— 4358 to 5142....	15,700	45,600	17,300		78,600
St. Charles— 5142 o 6024.....	12,600	63,400		13,700	89,700
Jefferson— 6024 to 6608....	7,300	38,300		13,500	59,100
Totals	64,903	323,900	49,700	225,315	663,818*

*Total levee line in District.

Recapitulation by Parishes, of Cubic Yards Required to Place Levee Line Above Described Grade.

Parish.	Cu. yds. of raising and enlargement.	Cu. yds. of new levees.	Total cubic yards required.
East Baton Rouge....	215,000	233,000	448,000
Iberville	357,000	90,000	447,000
Ascension	555,000	125,000	680,000
St. James	794,000	301,000	1,095,000
St. John	387,000	260,000	647,000
St. Charles	803,000	140,000	943,000
Jefferson	154,000	328,000	482,000
Totals	3,265,000	1,477,000	4,742,000*

*Total required in District.

The State has undertaken the construction of a new levee at Arlington in the Parish of East Baton Rouge, made necessary, as you are aware, by a recent cave of river bank and existing levee, amounting to 233,000 cubic yards at 18½ cents per cubic yard, at a cost of nearly $44,000, which is more than double the annual amount usually expended by the State in the Pontchartrain Levee District, and was only made possible by the increase of the funds ordinarily available for levee work, derived from sale of State swamp lands, and it should, therefore, be understood that the district cannot reasonably expect further aid from the funds administered by the State, either this season or the next.

As to what levee work is to be undertaken by the United States Government during the coming season, we are not prepared to state at this time, as the pending House Bill No. 12,346, for the improvement of Rivers and Harbors has not become a law.

Whilst we are aware that it is beyond the means of the district to undertake any large amount of levee work to full grade and section as prescribed by the Mississippi River Commission, yet there are several levees that will have to be re-built at some future date, on account of the caving of river banks, and we would advise, if you can find the available means to do so, the construction of a new levee at Hermitage, Ascension Parish, and New Hope, St. John Parish, and the raising and enlargement of the Darrowville and Hermitage levees in Ascension Parish, and the Angelina Levee in St. John Parish, which levees were nearly overtopped by the high water of 1897. These stretches have been surveyed and we have estimated that the quantity of earthwork required to build same to a grade of two feet above the high water of 1897 with crown 8 feet and slopes 3 and 3 on 1 to be as follows:

Name of Levee—Parish.	Length in feet.	Average height.	Above H. W. 1897.	Cubic Yards.
Hermitage—Ascension	4,603	12.	2.0	92,000
New Hope—St. John	2,442	16.6	2.0	88,000
Darrowville and Hermitage—Ascension	5,265		2.0	18,000
Angelina—St. John	2,629		2.0	16,000
Totals	14,939			214,000

Very respectfully,

The Board of State Engineers,

Per SIDNEY F. LEWIS,

Assistant State Engineer.

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., June 16th, 1903.

To the Honorable President and Members of the Board of Commissioners of the Pontchartrain Levee District.

GENTLEMEN: We have prepared in detail a tabulated statement showing the present condition of the one hundred and twenty-six miles of levee on the east bank of the Mississippi River extending from the lower limits of Baton Rouge, the upper end of the district, to the lower line of Jefferson Parish, the lower line of the district.

The height of the recent flood against your levees, from the official records, as compared with the flood of 1897, was as follows, viz:

At Baton Rouge, the highest gauge reading was six-tenths (.6) below high water of 1897; opposite Donaldsonville, the highest gauge reading was six-tenths (.6) below high water of 1897. At College Point, the highest gauge reading was two-tenths (.2) below high water of 1897. At the lower line of Jefferson Parish, the highest gauge reading was two-tenths (.2) above high water of 1897.

In anticipation of a greater flood all along the line, over twenty-one miles of levee less than one foot above the high water mark of 1897 were raised, of which one-half mile would have been overtopped by the water of the recent flood. During the flood which lasted over eight weeks many weak places were developed in the levees from holes made by crayfish and muskrats and other destructive agents, also sloughing of the land slope through defective drainage. Certain stretches of levee from their exposed position had to be protected from wave-wash, but there was no disaster, which, in a measure, was greatly due to the untiring care, and systematic efforts of the President and members of your Board, assisted by the planters, railroad authorities and parties at interest behind these embankments.

Respectfully submitted,

SIDNEY F. LEWIS,
Assistant State Engineer.

Statement showing approximate quantity of earthwork required to place the levee line of the Pontchartrain Levee District to a grade 3 feet above the high water of 1897; or to Mississippi River Commission grade (*i. e.* 4.6 above high water of 1897 at Baton Rouge and 3.3 at lower line of Jefferson Parish) and to build new levees where required to said grades, with crown 8 feet and side slopes 3 and 3 to 1.

Name of Levee	Station to Station	Length in Feet	Above H. W. 1897	Cu. Yds. for Englt. to a 3' Grade	Cu. Yds. for Enlgt. to M. R. C. Grade	Cu. Yds. for New Levee to 3' Grade	Cu. Yds. for New Levee to M. R. C. Grade	Remarks
	EAST BATON ROUGE PARISH.							
Magnolia Mound to Arlington	0- 151	15,100	3.5	.....	50,000	.....	.....	
Laurel to Conrad	241- 325	8,400	3.5	.....	28,000	.....	.....	
Martinez	383- 430	4,700	3.5	.....	16,000	.....	.....	
Gay Estate	430- 515	8,500	3.5	.....	30,000	.....	.....	
Ben Hur	515- 590	7,500	3.5	.....	25,000	.....	.....	
Ben Hur to Burtville	590- 691	10,100	3.5	.....	31,000	.....	.....	
		54,300			180,000			
	IBERVILLE PARISH.							
Benken	942- 976	3,400	1.0	19,000	35,000	72,000	100,000	Levee to near river bank to be enlarged
Billings	976-1022	4,600	3.0	.....	24,000	.....	.....	
Gomez	1078-1106	2,800	2.0	7,500	20,000	.....	.....	
Jolisaint	1277-1305	2,800	2.0	8,000	17,000	.....	.....	
Golden Gate to Oakley	1364-1447	8,300	3.0	.....	25,000	.....	.....	
Oakley to Evergreen	1447-1508	6,100	2.0	20,000	42,000	.....	.....	
Margaret	1508-1534	2,600	2.0	10,000	20,000	.....	.....	
Bagatelle	1534-1557	2,300	2.0	7,600	24,000	.....	.....	Levee too near river bank to be enlarged for a distance of 4,000 feet.
Ophelia to Lorio	1687-1738	5,100	1.0	27,000	56,000	78,000	90,000	
Welcome	1748-1764	1,600	1.0	9,500	21,000	.....	.....	
Arizona to Parish Line	2043-2145	10,200	2.0	35,000	70,000	.....	.....	
		49,800		143,600	354,000	150,000	190,000	

	ASCENSION PARISH.							
Parish Line to Cottage Farm	2145-2330	18,500	2.0	57,000	118,000	.....	.....	
Linwood to Belle Helene	2330-2448	12,800	3.0	.....	45,000	.....	.....	
Landry	2458-2493	3,500	2.0	10,000	23,000	.....	.....	
Willow Grove	2493-2509	1,600	3.0	.....	5,300	.....	.....	
Gem	2509-2520	1,100	2.0	3,500	7,500	.....	.....	
Le Blanc	2685-2700	1,500	2.0	4,200	9,000	.....	.....	
Von Hoff	2700-2711	1,100	1.0	5,700	8,700	.....	.....	
Jamison	2711-2754	4,300	2.0	12,000	24,000	.....	.....	
Darrowville	2754-2777	2,300	2.0	7,000	15,000	.....	.....	
Hermitage	2777-2815	3,800	2.0	14,000	28,000	.....	.....	
Hermitage	2815-2919	10,400	2.0	28,000	57,000	.....	.....	
Bocage	2919-2953	3,400	1.5	15,000	26,000	.....	.....	
Miles Residence to Store	3020-3041	2,100	2.0	6,500	13,500	.....	.....	
		66,400		162,900	380,000	.....	.....	
	ST. JAMES PARISH.							
Parish Line to Bagatelle	3141-3176	3,500	1.5	15,000	25,000	.....	.....	Levee too near river bank to be enlarged, new levee will be required
Bagatelle	3176-3184	800	.....	.....	.....	15,000	20,000	
St. Mary's Chapel Settle	3184-3238	5,400	1.5	20,000	34,000	.....	.....	Levee too near river bank to be enlarged, new levee will be required.
St. Rose to Nita	3448-3478	3,000	1.0	.....	.....	85,000	110,000	
Nita	3478-3522	4,400	1.5	20,000	34,000	.....	.....	
Celestine	3522-3544	2,200	1.0	.....	.....	65,000	75,000	Caving bank new levee will be [required
Lillie to Uncle Sam	3544-3577	3,300	1.5	16,000	27,000	.....	.....	
College Point	3762-3800	3,800	2.0	9,100	20,000	.....	.....	
Oneida (upper)	3800-3890	9,000	1.0	49,000	77,000	.....	.....	
Oneida (lower)	3890-3909	1,900	1.5	9,000	15,000	.....	.....	
Belmont	3909-3948	3,900	1.0	28,000	44,000	.....	.....	
St. Elmo	4045-4082	3,700	2.0	11,000	24,000	.....	.....	
Longue Vue	4082-4110	2,800	1.0	15,000	24,000	.....	.....	
Lutcher	4215-4262	4,700	1.5	22,000	38,000	.....	.....	
		52,400		214,100	362,000	165,000	205,000	

Name of Levee	Station to Station	Length in Feet	Above H. W. 1897	Cu. Yds. for Enlgt. to a 3' Grade	Cu. Yds. for Enlgt. to M.R.C. Grade	Cu. Yds. for New Levee to 3' Grade	Cu. Yds. for New Levee to M.R.C. Grade	Remarks
				ST. JOHN PARISH.				
New Hope	4442-4467	2,500	2.0	8,200	17,000	.....	.....	
Hope (New Levee)	4467-4489	2,200	.....	.....	.....	80,000	90,000	Caving bank new levee will be required.
Hope	4467-4556	8,900	1.5	35,000	61,000	.....	.....	
Glencoe to Reserve	4456-4694	23,800	1.0	120,000	188,000	.....	.....	
Reserve	4694-4738	4,400	1.0	24,000	38,000	.....	.....	
Reserve-Belle Point	4738-4834	9,600	1.0	50,000	76,000	.....	.....	
Belle Point to Laplace	4834-4910	7,600	1.5	30,000	50,000	.....	.....	
Louque	5005-5027	2,200	.....	.....	.....	55,000	70,000	Levee too near river bank to be enlarged, new levee will be required.
Bonnet Carre-Anchor	5009-5142	13,300	3.0	.....	75,000	.....	.....	
		74,500		267,200	505,000	135,000	160,000	

ST. CHARLES PARISH.

Anchor-Gypsy	5142-5201	5,900	1.0	43,000	65,000	.....	.....	
Gypsy-Hermitage	5201-5280	7,900	1.0	42,000	55,000	.....	.....	
Hermitage	5280-5345	6,500	1.0	38,000	50,000	.....	.....	
Roseland	5345-5363	1,800	0.5	12,000	13,500	.....	.....	
Diamond	5363-5395	3,200	1.5	.....	.....	82,000	90,000	Settling bank; new levee might be required.
Good Hope-Prospect	5395-5517	12,200	1.0	72,000	92,000	.....	.....	
Sarpy Crevasse	5517-5545	2,800	.....	30,000	37,000	.....	.....	
Victoria to Ormond	5545-5609	6,400	1.5	32,000	45,000	.....	.....	
Red Church	5609-5665	5,600	1.0	28,000	34,000	.....	.....	
Destrehan	5665-5734	6,900	1.0	35,000	41,000	.....	.....	
Modoc and Pecan Grove	5734-5795	6,100	2.5	10,000	16,000	.....	.....	
Pecan Grove Lower	5795-5830	3'500	1.5	12,000	16,500	.....	.....	
St. Rose and Almedia	5830-5959	12,900	1.0	64,000	73,000	.....	.....	
Upper Fairview	5959-6002	4,300	2.0	10,000	19,000	.....	.....	
Lower Fairview	6002-6024	2,200	1.5	10,000	16,000	.....	.....	
		88,200		438,000	573,000	82,000	90,00	

Name of Levee	Station to Station	Length in Feet	Above H. W. 1897	Cu. Yds. for Enlgt. to a 3' Grade	Cu. Yds. for Enlgt. to M.R.C. Grade	Cu. Yds. for New Levee to 3' Grade	Cu. Yds. for New Levee to M.R.C Grade	Remarks
	JEFFERSON PARISH.							
Butler-Kenner	6021-6030	900	.....	.....	.....	.....	23,000	Levee too near river bank to be enlarged; new levee will be required.
Parish Line to Hanson City	6024-6062	3,800	0.5	25,000	30,000	.....	.....	
Upper Kennerville	6077-6105	2,800	1.0	15,000	20,000	.....	.....	
Kennerville	6105-6156	5,100	0.5	.....	33,000	.....	.....	
Trudeau	6156-6189	3,300	0.5	.....	25,000	.....	.....	
Sauve	6189-6237	4,800	1.0	.....	35,000	.....	.....	Caving bank in front of Weckerling Farm; new levee will be required.
Sauve-Boisblanc	6237-6271	4,000	.....	.....	.....	.....	160,000	
Boisblanc	6271-6291	2,000	1.0	.....	10,000	.....	.....	
Perkins	6291-6321	3,100	.....	.....	.....	.....	60,000	Levee too near river bank to be enlarged; new levee will be required
Tchoupitoulas	6321-6383	6,200	1.0	.....	32,000	.....	.....	
Lower Tchoupitoulas	6383-6393	1,000	2.0	.....	3,000	.....	.....	
Southern University	6393-6419	2,600	1.0	.....	13,000	.....	.....	
Lafreniere-Elmwood	6419-6483	6,400	1.5	.....	23,000	.....	.....	
Labarre	6483-6527	4,400	2.0	.....	10,000	.....	.....	Caving bank; probable new levee will be required.
Skidmore	6575-6584	900	.....	.....	.....	.....	40,000	
Southport	6593-6608	1,500	.....	.....	.....	.....	55,000	Caving bank; probable new levee.
		52,800		40,000	234,000	.....	338,000	

RECAPITULATION

Parish	Enlargement		New Levees	
	Cu. Yds. for 3' Grade	Cu. Yds. for M. R. C. Grade	Cu. Yds. for 3' Grads	Cu. Yds. for M. R. C. Grade
E. Baton Rouge....	.....	180,000	.....	.....
Iberville.....	143,600	354,000	150,000	190,000
Ascension	162,900	380,000	.....	.....
St. James.....	214,100	362,000	165,000	205,000
St. John.....	267,200	505,000	135,000	160,000
St. Charles.....	438,000	573,000	82,000	90,000
Jefferson	40,000	234,000	.....	338,000
	1,265,800	2,588,000	532,000	983,000

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 1st, 1903.

To the Honorable President and Members of the Board of Commissioners of the Lafourche Basin Levee District.

GENTLEMEN: In view of the fact that owing to the rapid decline in the river it will be practicable to resume work on the levees throughout your district at a much earlier period than in previous years; we have prepared in detail a statement showing the present condition of the one hundred and twenty miles of levee on the Mississippi River extending from Donaldsonville, at the head of Bayou Lafourche, the upper end of the district, to the lower end of Riceland plantation, in Plaquemines Parish, the lower limits of the district.

The height of the recent flood against your levee line on the river, from the official records, as compared with the flood of 1897, was as follows, viz:

At Donaldsonville, the highest gauge reading was six-tenths (.6) below high water of 1897.

At Cabanocey, eighteen miles below Donaldsonville, the highest gauge reading was two-tenths (.2) below high water of 1897.

At Nine Mile Point, the highest gauge reading was two-tenths (.2) above high water of 1897.

At Gouldsboro, the highest gauge reading was eight-tenths (.8) above high water of 1897.

At Riceland, the highest gauge reading was over one foot above high water of 1897.

The high water of 1903 was reached in the lower end of your district in the beginning of March, and its culminating point about the 21st of March, whilst at Donaldsonville it reached its highest from April 4-10, inclusively.

The levees in Plaquemines Parish were not only subjected to a greater and longer strain from a higher flood in the river than ever known before, but were considerably endangered from wave-wash caused by the prevailing winds at this time of the year, and the passing of large ocean steamers—notably was the case at the upper end of Myrtle Grove plantation where the levee for a mile was almost breached in several places by the waves caused by high winds on February 25th and 26th.

We believe it would be well, and we have so estimated in the tabular statement, to increase the grade of future work in Plaquemines Parish to three feet above high water of 1903, instead of the present Mississippi River Commission grade.

On March 26th, late at night, a hole broke out at the base of the Hymelia Levee, below the upper line of the Parish of St. Charles, and before anything could be done to stop it, the crown of the levee fell in, and the levee was crevassed. By the persistent and worthy efforts of your Board, assisted by the planters and the railroad authorities, made in its enclosure, its discharge never appreciably affected the flood stage, which had practically culminated at the time the break occurred, and in consequence the damage from overflow was very much restricted.

On April 5th, when the river was at its highest stage, and near the top of the levee, the caving of the bank breached the levee near the upper line of Magnolia Plantation, in the Paris hof Plaquemines. The cave took in a part of the land side base for a length of two hundred and thirty feet, and the water at once ran over the remaining part of the levee some two feet deep, and later five or six feet deep. By prompt action the planters, your Board and the officials of the New Orleans, Fort Jackson and Grand Isle Railroad succeeded in securely closing the break and prevented any serious damage from overflow.

On Bayou Lafourche, the highest water reached was as follows: viz:

At Donaldsonville, .6 below high water of 1897.

At Napoleonville, .5 below high water of 1897.

At Thibodaux, .9 above high water of 1897.

At Raceland, .8 above high water of 1897.

At Lockport, about .7 above high water of 1897.

At Harang's, about .5 above high water of 1897.

There were no breaks on the east bank of the bayou, whilst there were three on the west bank.

We have not prepared any statement in this report as to future levee work to be undertaken by your Board on Bayou Lafourche, pending the status of the present injunction suit which is now awaiting a verdict from the Supreme Court. I have made a recent inspection of the levees on Bayou Lafourche, so we are prepared at any time, when called upon, to furnish a statement.

There has been no levee work undertaken by the State in your district since 1901. The allotments from the General Engineer Fund since your organization up to 1901 amount to $194,431.15; the expenditures from said Fund amount to $177,891.94; leaving a balance to your credit of $16,539.21.

It is possible, although the fund is not yet available, that you will be allotted for 1903 a sum similar to that which you have been receiving in the past ten years, say, $20,000.

Very respectively,

The Board of State Engineers,

Per SIDNEY F. LEWIS,

Assistant State Engineer.

Statement showing approximate quantities of earthwork required to place the levee line of the Lafourche Basin Levee District to Mississippi River Commission Grade. (*i. e.* 4.4 feet above high water of 1897 at Donaldsonville, and 3.3 feet at lower line of Jefferson Parish, and 3.0 above high water of 1903 in Plaquemines Parish) and build new levees where required with 8 foot crown, with slopes of 3 and 3 to 1.

Name of Levee	Station to Station	Length in Feet	Above H. W. 1897	Cu. Yds. of Enlgt. required for M.R.C.Gr.	Cu. Yds. of New Levees necess'y for M.R.C.Gr.	Remarks
			ASCENSION PARISH.			
Donaldsonville Front	0-50	5,000	3.5	14,000	.....	
Esnault to Simms	50-70	2,000	3.0	9,000	.....	
Peytavin	70-94	2,400	2.0	16,000	.....	
Landry	94-108	1,400		.....	45,000	1,300 feet of levee too near river bank to be enlarged—probable new levee required.
		10,800		39,000	45,000	
			ST. JAMES PARISH.			
Salsburg	442-447	500	1.0	5,000	.....	From upper end of Salsburg to Brookstown badly wave-washed.
Lauderdale	472-491	1,900		.....	60,000	Caving bank, probable new levee required.
Acadia	523-539	1,600		.....	42,000	New levee staked out and notes issued.
New Hope	606-628	2,200	1.0	20,000	.....	Enlargament staked out and notes issued.
Welcome	628-660	3,200		.....	65,000	New levee staked out and notes issued.
Jamestown	660-673	1,300	2.0	8,000	.....	Enlargement staked out and notes issued.
St. Clair-St. Cecile	695-806	11,100	2.0	62,000	.....	
St. James Church	876-893	1,700	2.0	.....	45,000	Levee too near river bank to be raised, new levee required.
Pikes Peak	1040-1082	4,200	2.5	24,000	.....	
St. Joseph	1219-1298	7,900	1.0	68,000	.....	
Armant	1298-1363	6,500	2.0	36,000	.....	
Laura	1363-1400	3,700	2.0	20,000	.....	
Magnolia	1400-1471	7,100	2.5	26,000	.....	
Wauguespach	1471-1529	5,800	2.5	26,000	.....	
		58,700		295,000	212,000	

ST. JOHN PARISH.						
Upper St. John	1529-1575	4,600	3.0	12,000	.....	
Poor Devil Store	1575-1582	700	2.0	.....	20,000	Levee too near river bank to be enlarged, new levee required.
Poor Devil Store	1582-1589	700	2.0	4,000	.....	
Horn Store	1589-1620	3,100	2.0	.....	70,000	Levee too near river bank to br enlarged, new levee required.
Willow Grove Store	1649-1663	1,400	2.5	10,000	.....	
Whitney to Evergreen	1707-1721	1,400	2.5	12,000	.....	
Stevenson to Bonsecour	1786-1881	9,500	2.5	45,000	.....	
Columbia	1935-2010	7,500	1.0	74,000	160,000	Levee too near river bank to be enlarged, probable new levee required.
St. John Church	2010-2063	5,300	2.0	27,000	.....	
Gold Mine	2104-2153	4,900	2.0	27,000	.....	
Bonnet Carre Settlt	2153-2245	9,200	2.5	33,000	.....	
Above Parish Line	2303-2316	1,300	3.0	4,000	.....	
		49,600		248,000	250,000	
ST. CHARLES PARISH.						
Hymelia Crevasse	2316-2328	1,200		.....	70,000	
Hymelia	2328-2356	2,800	2.0	17,000	.....	
Kilona to Star	2471-2554	8,300	2.0	53,000	.....	
Star	2554-2592	3,800	2.0	.....	65,000	Caving bank new levee required.
Star to Pelican	2592-2630	3,800	2.0	24,000	.....	
Flagtown to Ashton	2760-2873	11,300	2.5	60,000	.....	
Ashton	2873-2898	2,500	2.5	17,000	.....	
Luling	2920-2948	2,800	2.0	22,000	.....	
Lone Star	2978-3011	3,300	2.5	15,000	.....	
Davis	3032-3065	2,800	2.5	10,000	.....	
		42,600		218,000	135,000	

Name of Levee	Station to Station	Length in Feet	Above H. W. 1903	Cu. Yds. of Enlgt. required for M. R.C.Gr.	Cu. Yds. of New Levees necess'y for M. R.C.Gr.	Remarks
	JEFFERSON PARISH.					
			Above H. W. 1903			
Willswood	3463-3536	7,300	2.0	30,000		
Fairfield	3658-3737	7,900	1.5	50,000		
Fairfield	3737-3785	4,800	2.0	26,000		
Le Breton	3785-3820	3,500	1.5	20,000		
Nine-Mile Point	3820-3926	16,000	2.0	45,000		
T. & P. R. R. Property	3926-3956	3,000	1.0	17,000		
Co. Canal to Four Oaks Plantation	0-90	9,000	.5	78,000		Upper end U. S. Barataria Levee District.
Southside	90-125	3,500	1.0	23,000		
Amesville	125-171	4,600	1.5	23,000		
Bell Crevasse to Parish Line	171-380	20,900	1.0	134,000		
		75,100		446,000		

PLAQUEMINES PARISH.

Upper Magnolia	1107-1178	7,100	1.5	25,000		
Little Rock Settlt	1178-1196	1,800	1.0	4,000		
Fort St. Leon	1196-1255	5,900	1.0	11,000		
Belle Chasse Upper	1255-1300	4,500	1.0	25,000		
Belle Chasse Lower	1380-1407	2,700	1.0	14,000		
St. Ann	1407-1459	5,200	1.5	18,000		
Concession	1459-1506	4,700	1.0	24,000		
Oak Point	1581-1609	2,800	1.0	15,000		
Cedar Grove	1609-1679	7,000	1.0	35,000		
Oakville to Sarah	1679-1745	6,600	1.0	35,000		
Live Oak Grove	1745-1782	3,700	1.0	23,000		
Dobard	1801-1835	3,400	1.5	13,000		
Dobard	1835-1847	1,200	2.0	3,000		
Happy Point	1847-1917	7,000	1.5	27,000		
Star	1939-1961	2,200	1.5	9,000		
Star	1961-1985	2,400	2.0	6,000		
Tacoma to Alliance	1985-2112	12,700	1.0	67,000		
Alliance	2134-2166	3,200	1.0	.....	55,000	Caving bank new levee will be required.
Ironton	2239-2259	2,000	1.0	10,000		
Myrtle Grove	2279-2384	10,500	1.0	54,000		Badly wave-washed.
Woodpark	2384-2394	1,000	2.0	2,300		
Oakland	2394-2420	2,600	1.5	10,000		
Larose to Deer Range	2420-2517	9,700	1.0	50,000		
Deer Range	2517-2533	1,600	2.0	4,000		
Deer Range to West Pointe a la Hache	2533-2842	30,000	1.5	110,000		Levee at Pointe Celeste too near river bank to be enlarged, probable new levee required at Diamond Store through caving of river bank.
West Pointe a la Hache	2842-2867	2,500	2.0	5,500		
Magnolia	2867-2891	2,400		.....	40,000	Caving bank new levee will be required.
Magnolia to Riceland	2891-3072	8,100	1.5	40,000		
Riceland	3072-3110	2,800	1.5	15,000		
		159,200		654,800	95,000	

RECAPITULATION.

PARISH	CUBIC YARDS	
	Enlargemen to M. R. C. Grade	New Levee to M. R. C. Grade
Ascension	39,000	4,5000
St. James	295,000	212,000
St. John	248,000	250,000
St. Charles	218,000	135,000
Jefferson	446,000	.....
Plaquemines	654,800	95,000
	1,900,800	737,000

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Aug. 18, 1903.

To the Honorable Board of Levee Commissioners, of the Orleans Levee District, Room 14 Masonic Temple, New Orleans, La.

GENTLEMEN: We are in receipt of a letter from your Secretary, dated August 14, 1903, and enclosing "four set of plans and specifications for proposed contract work in the Orleans Levee District," and which are transmitted to us for our approval.

We have given this matter due consideration, and beg to submit the following:

First. The plans, location and specifications for the construction of a new levee from Adams to Short Street, left bank, are approved.

Second. The plans, location and specifications for the "enlargement and re-modeling of the Second Street Levee," left bank, are approved.

Third. The plans and specifications for the "Aurora Enlargement," right bank, are approved. In connection with this work, however, we beg to call your attention to the fact that the Aurora levee is in a slightly concave bend of the river, and that an inspection of the soundings of that reach shows rather steep contour lines on the west bank of the river close to the shore where the levee is located. We, therefore, think that this bank at some time, may be subject to caving, and that the lifetime of the proposed enlargement may be of a limited character. At present the line of levee is not endangered by caving, but this may occur at any time, and therefore, we desire to submit this fact to your consideration.

Fourth. The plans and specifications for the "Orleans Enlargement," right bank, are approved.

Very respectfully yours,
The Board of State Engineers,
Per ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 20, 1902.

Hon. Jno. Dymond, Prest. Board of Commissioners, Lake Borgne Basin Levee District, New Orleans, La.

DEAR SIR: In accordance with the request of your Honorable Board, as expressed to me at your last meeting on the 16th of May

ult., I have examined the present condition of the levees in the upper portion of your district, accompanied by Hon. Lovinsky Nunez, your Inspector.

I would respectfully recommend a new levee, below the sugar house and quarters, in front of the Scarsdale Plantation, to be built before the next high water, as the present levee is liable to be breached this season through the caving of river bank. A line for a new levee, amounting to about 45,000 cubic yards of earthwork, as per enclosed plan, which shows the location thereof as well as the river bank lines up to date, was located at this point some two years ago by the United States Engineer in charge of this district, but was not built in deference to the wishes of the proprietors.

As to the levees in the upper end of the district, from Jackson Barracks to the United States Cemetery, I believe the same can be maintained on their present line by increasing their section and protecting same with revetments, as per enclosed plans and specifications. It will take about 27,500 cubic yards of earthwork to bring these levees up to Mississippi River Commission grade, with increased section; and about 216,725 feet B. M. lumber for revetments to protect same.

This does not include work that should be done in front of the Crescent City Slaughter House Company's property, nor that in front of the United States Cemetery, as these two places require special treatment. The front of the Slaughter House property is situated in a washing bank of the river, and not a caving bank, and for this reason I believe the same can be held for some years to come if heavy sheet piling be deeply driven, well braced, and earth filled in between it and the levee. In front of the United States Cemetery, the river bank here is a caving one, and will require mattressing, otherwise the levees along this stretch will be breached.

The character of work required at these two points, is beyond the means and province of the district, especially where the construction of new levee would not entail very much expense to the district; and I believe should be relegated to the Crescent City Slaughter House Company, Limited, and to the United States Government, respectively.

Respectfully submitted,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 14, 1903.

Mr. H. N. Nunez, Secretary Board of Commissioners Lake Borgne Basin Levee District, New Orleans, La.

DEAR SIR: A copy of the resolutions passed by the Lake Borgne Basin Levee District at its meeting held in New Orleans on the 12th day of March, 1903, and dated March 13th, 1903, which you forwarded to the Board of State Engineers, was duly received.

In answer I will state that two members of this Board, in company with Mr. Jno. Dymond, yourself, and other gentlemen, visited the Ship Island Canal Company Locks, on March 14th, and thoroughly examined the same. At the time of the examination we found no danger of overflow coming from said locks. A slight sloughing in the earthen approaches was noticed on both sides of the front gates of the lock, but in our opinion this was not a source of danger to the levee.

We would suggest, however, that you have this sloughing carefully watched, and, should it develop to any greater extent, then we suggest that the proper remedy would be to fill in the front slope of the earthen approach of levees with loose dirt, so as to widen said approaches, and dry up their land slope.

Very respectfully,
HENRY B. RICHARDSON,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 6th, 1904.

Hon. Aaron Davis, Prest., and Members, Board of Commissioners, for the Plaquemines Parish East Bank Levee District.

GENTLEMEN: I beg leave to report that the work done by Dowdle & Windett, contractors, for Section No. 1 Gulf Coast Levee, as certified by me on March 21st, 1904, amounted to 126,800 cubic yards of earthwork, which is approximately one-quarter of the total yardage in Section No. 1 Gulf Coast Levee. As you are aware, nothing has been done on Sections 2 and 3.

I have also certified to 96,235 feet of drainage ditch done by Chas. G. Schayot, contractor, as per reports of your inspector. I have also certified to the construction and placing of 29 drainage boxes in the line of levee by Gustave Favrot, contractor, as per inspection and supervision of your inspector.

The Board of State Engineers is now prepared to advertise for proposals and enter into a contract for the construction of a side levee connecting the upper end of your district with the levee on the Mississippi River front. The survey for this levee has been made, and it is estimated that it will require about 19,000 cubic yards of earthwork.

Yours very respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 17th, 1902.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR:—In compliance with the request of the Board of Commissioners of your district, as expressed in the minutes of the meeting held on the 14th of May, 1902, to submit a report in regard to the matter brought before the Board by Mr. W. E. Glassell, relative to "digging a ditch to drain certain lands," the Board of State Engineers begs leave to say:

1st. That it understands that the only information herein desired by the Board of Commissioners in regard to the matter, is to whether the ditch proposed by Mr. Glassell would or would not improve the condition of the lands in Soda Lake, still owned by the levee district.

2nd. That it was found, on examination, that the larger part of the lands in Soda Lake, still owned by the levee district, are situated in the low water channel of said lake, which is, and must at times remain for an indefinite period subject to overflow from [illegible] water to a greater or less extent, according to seasons—at least, [illegible] greater changes occur in local conditions than have so [illegible] the processes of improvement [illegible] and about the lake, [illegible] the lands bordering [illegible]

[illegible] W[illegible] as to [illegible] gard to the [illegible] expected for [illegible] Soda Lake [illegible] proposed by [illegible] that it be- [illegible] extension [illegible] ears been [illegible] improve

conditions for the lands in question, though, owing to the extent of the rain shed above, exemption at all times from overflow from rain water should not be expected, with any channel which it would appear practicable to provide.

Respectfully submitted,
The Board of State Engineers,
Per FRANK M. KERR.
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Sept. 8th, 1902.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR—In compliance with the request of your Board, at its meeting of June 18th last, to make an examination of the river bank at Long Point, Magnolia, Caspina and Campo Bello Plantations, and to report to you with recommendations at your next regular meeting upon the extent and seriousness of the caving at said points, I beg leave to submit the following, viz:

On August 7th, in company with Commissioners Robson and Robinson, I visited the localities named and found the following conditions to exist: At Long Point Plantation, a tendency to cave has recently developed along the lower side of this point, and for a distance of about a quarter of a mile the width of batture between the river bank and the line of levee averages only about 100 feet. The levee line, however, is not at this time in danger of becoming breached, and provision for a new line of levee may be deferred until a future date, dependent upon developments.

At Magnolia Plantation the caving is serious and the line of levee threatened. Least width of batture but 70 feet. A new levee is required. Estimated contents, about 25,000 cubic yards.

At Caspiana Plantation, caving serious, least width of batture being only 137 feet, but levee line not immediately threatened. Further developments should be awaited here before determining upon the location and extent of work required.

At Campo Bello Plantation, caving serious, least width of batture only 85 feet, and steadily extending. New levee required. Estimated contents about 45,000 cubic yards.

Provision for constructing the new levees required at Magnolia and Campo Bello should be made at earliest possible date.

Since the meeting of your Board I was also requested by you to make an approximate estimate of the number of cubic yards of excavation required to dig a ditch from the mouth of Little Pass to a point in Soda Lake about opposite Gum Spring, to aid in relieving certain lands just above, in the vicinity of the mouth of Cottonwood Bayou, from overflow from rain water, when the stages of back water from Red River below would permit, as described by Mr. W. E. Glassell.

In this connection I would respectfully say that this project has already been reported upon to your Board by this department, under date of June 17th, 1902, and with the qualifications therein set forth, reaffirmed herein, beg leave to submit that the number of cubic yards of excavation required to dig such a ditch between the points named should not exceed 60,000.

I expect and shall use every endeavor to be with you at the meeting of your Board on the 17th of this month, and write in advance in regard to the foregoing matters only because I am called upon to make a tour of inspection in the Red River, Atchafalaya and Bayou Boeuf Levee District this week, leaving here to-morrow, and I might not find time between this and the date of your meeting to prepare a written report as desired.

Yours very truly,

F. M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Jan. 7th, 1903.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR—The Board of State Engineers has the honor to submit for the consideration of the Board of Commissioners of the Caddo Levee District, at its meeting this day, the following report in regard to the high water of December, 1902, in that part of Red River along which the Caddo Levee District extends, the effects produced by it upon the public levees of the district, and the immediate requirements of the latter resulting therefrom.

Exact statements in regard to the height attained by the river, throughout the length of the district, as compared with previous high waters, can not yet be given, as neither the time nor the opportunity to make the surveys necessary to establish the facts

has yet been available, but, from a reconnaissance made at about the time of the highest stage of the river, the following deductions are warranted:

First. From the State line to the vicinity of Dooley's Bayou an elevation of about two (2) feet higher than the high water of 1892 was reached. The highest water of previous record from the State line to the vicinity of Red Bayou was that of 1892; from the vicinity of Red Bayou to the vicinity of Eric's Point that of 1894, the latter being on an average about one foot higher than the high water of 1892 on that part of Red River.

Second. From the vicinity of Dooley's Bayou to the vicinity of Eric's Point, somewhat higher than the high water of 1894—the highest of record for that part of Red River.

Third. From the vicinity of Eric's Point to the vicinity of Shreveport, about equal to the high water of 1894, which, at Eric's Point and at Shreveport, was about one foot lower, and at Cuba Plantation, about midway, about four feet lower than the high water of 1892—the highest of record for that part of Red River.

Fourth. From Shreveport to the vicinity of Lattier's cut-off, somewhat lower than the high water of 1894. On this part of Red River the high waters of 1894 and 1892 were, generally, about equal in height, and were the highest of record.

Fifth. From the vicinity of Lattier's cut-off to the vicinity of Magnolia Plantation, somewhat higher than the high water of 1895—the highest of previous record for that part of Red River.

Sixth. From the vicinity of Magnolia Plantation to the lower end of the district, about equal to that of 1892—the highest of record for that part of Red River.

Notwithstanding this high stage of water, your levee line stood from one and a half (1½) to six (6) feet above it (the greater length of line averaging three feet above the surface of the water at its highest stage), except at the head of Simpson's Lake, and at Hurricane Bluff Place, above Shreveport, and at Long Point, Ashwood and Upper Pascagoula, below Shreveport. At these places, for short lengths, aggregating about one and a half miles, the river threatened to overtop the levees, and it became advisable to raise the two first and the two latter to some extent. As the total length of your levee line is about 78 miles, the extent of precariously low levee in your district proved, therefore, during the high water, to be only about two (2) per cent.

One breach in the line occurred from the succumbing of the levee embankment direct, namely, at the Thompson Place, and three from caving banks, at Magnolia, Whitehall and Campo Bello. Through the first, the river escaped and caused a considerable overflow, but by the prompt and energetic action of the local levee commissioners and riparian proprietors, run-arounds were built and maintained at the three latter.

While the levees at Magnolia and Campo Bello were already more or less threatened by the caving of the river banks, previous to the advent of high water, that at Whitehall was not, and the excessive caving and breach in the levee there was the direct result of the cut-offs through Magnolia and Lovely Points, which took place at about the time of the highest stage in the river at those points. Much alarm was felt at times at several points in the district on account of seepage, but at no place did the alarm prove justifiable.

A fair estimate of the amount of raising and enlarging which should be promptly considered by your district may be easily arrived at, at this time, but the river has not yet, throughout the length of the district, receded sufficiently to permit a full estimate of the probable extent of new levees which may be required in consequence of caving banks.

The Board of State Engineers, therefore, presents to you, today, only a preliminary statement of the immediate requirements of the district as follows:

Name of Levee—Character of Work.	Cubic Yards.
ABOVE SHREVEPORT.	
Simpson Lake—Raising and enlarging	15,000
Thompson—New levee	35,000
Hurricane Bluff—New levee and raising and enlarging	40,000
BELOW SHREVEPORT.	
Upper Eagle Bend—Raising and enlarging	10,000
Bagley—Raising and enlarging	25,000
Long Point—New levee and raising and enlarging	40,000
Woodlawn—Raising and enlarging	15,000
Ashwood—Raising and enlarging	25,000
Upper Pascagoula—Raising and enlarging	30,000
Magnolia—New levee	30,000
Whitehall—New levee	25,000
Campo Bello—New levee	55,000
	345,000

Of the foregoing, the State has already provided for the construction of the new levees at Thompson's, Magnolia, and Campo Bello, amounting to 120,000 cubic yards, leaving your district,

therefore, to make provision at this time for about 225,000 cubic yards.

While, as already stated, conditions are not yet ripe to permit a forecast of the requirements of the district beyond its apparently immediate needs, it is safe to say that at no distant day the district may be called upon to additionally supply new levees at Elmer, Wild Lucia and Cedar Bluff, above Shreveport, and at Dixie and Cross Keys, below.

The work from Eric's to Buckhall, above Shreveport, under contract with Hunt and Jordan Bros., was interrupted by high water, but, from information received from the contractors, it is learned that work has already been resumed.

It is also understood that such changes have occurred in the river bank, from caving, and in the elevation of the ground, by reason of washouts, along that part of the line in the vicinity of Pickett Station, on the T. S. & N. R. R., that it may be necessary to reconsider the agreement entered into by your Board with the authorities of the said road September 17th last, in regard to the location of the levee from Station 165 plus 65 to Station 192 plus 80.

However, the Board of State Engineers would suggest that action in regard to this matter be deferred until a special examination of existing conditions can be made, and further recommendations submitted.

Respectfully,
The Board of State Engineers.
Per FRANK M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
SHREVEPORT, LA., April 22d., 1903.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

SIR—At the meeting of the Board of Commissioners of the Caddo Levee District of January 7th, 1903, the Board of State Engineers submitted a report in which levee work at Simpson Lake, Hurricane Bluff, Upper Eagle Bend, Bagley, Long Point, Woodlawn, Ashwood, Upper Pascagoula, and Whitehall, estimated at 240,000 cubic yards of earthwork was recommended for construction, all of which, with the exception of the work at Simpson Lake, estimated at 15,000 cubic yards, has been put under contract.

The Board of State Engineers now desires to recommend additional levee work for construction at the following named places, viz:

Localtiy.	Approximate contents cubic yards.	Remarks.
ABOVE SHREVEPORT.		
Cavitts	110,000	
Elmer	40,000	
Wild Lucia	55,000	
Cedar Bluff	25,000	
Sterling Bayou	20,000	
		250,000 Cu. yds.
BELOW SHREVEPORT.		
Logie Lea	105,000	
Cross Keys	95,000	
		200,000 Cu. yds.

RECAPITUATION.

Above Shreveport	250,000 cubic yards.
Below Shreveport	200,000 cubic yards.
Total	450,000 cubic yards.

	Cu. Yds.
Amount previously recommended and undertaken by the district	240,000
Contracts holding over from last season, not yet completed (Eric to Buckhall)	360,000
Total under contract and additional work recommended	1,050,000

The cost of the district work under contract to date is approximately $80,000.

At Cavitt's, the distance from the centre of the levee to the river bank is only 75 feet, and the bank will continue to cave seriously.

This levee is quite a large one, averaging about 12 feet in height, and is situated just above Red Bayou.

At Elmer, the distance from the centre of the levee to the river bank is only 45 feet, and the bank will continue to cave seriously.

This levee will average about 9 feet in height, and is situated but a short distance below the Thompson crevasse.

With the prospect of a breach in the line of levee at Elmer it would be useless to close the break at Thompson's.

At Wild Lucia, the distance between the centre of the levee and the river bank is still as much as 135 feet, but the levee is situated on the concave side of an abrupt bend, and continued serious caving must be feared.

At Cedar Bluff the distance between the centre of the levee and the river bank is still 165 feet, but the levee is situated on the upper side of a point in a narrow part of the river, across which high water seeks to flow with great energy, and continued serious caving may be expected there. This line of levee, too, is considerably overgrown with young cottonwood trees, etc. The average height of the Cedar Bluff Levee is about 10 feet.

At Sterling Bayou, the distance between the centre of the levee and the river bank is only 125 feet. This levee does not average much more than about 6 feet in height, generally, and but for the fact that it crosses a bayou, where the fill is probably about 20 feet, its construction might be deferred for the present.

At Logie Lea, the river bank has already caved into the river slope of the levee, and the latter may be, practically, regarded as breached, with continued serious caving to follow.

Recognizing the urgency of dispatch in building new levees at points where breaches exist, or are soon likely to occur, and the contractor for the Upper Pascagoula enlargement being on the ground, but still unable on account of the soggy condition of the batture to proceed with the enlargement work, he was furnished with lists of dimensions and specifications for a part of the Logie Lea Levee, and directed to proceed with the work there.

Your approval of this course is respectfully asked.

At Cross Keys, the levee line is breached for a length of about 900 feet, and there is no recourse left for the district but to build a new levee there with the least possible delay.

At Long Point, continued caving necessitated changes in the locations of Section Nos. 1 and 3, but by withdrawing, for the present, the enlargement work, known as Section No. 2, which is, hereby, under the circumstances, recommended, the yardage under the Long Point contract will not be materially increased.

At Whitehall it was finally decided to build the short line across the Point, calling for some 8,000 cubic yards of earthwork less than in the longer line at first adopted.

Considerable anxiety having been expressed about conditions at Dixie and Upper Eagle Bend, a special visit was again made to these places yesterday, after the completion of examinations throughout the balance of the district.

The situation at Dixie does not, at this time, appear to demand the immediate construction of a new levee there. The least distance between the centre of the levee and the river bank is 170 feet,

and the bend seems to be growing less abrupt and somewhat less sensitive to caving than at one time apparent.

At Upper Eagle Bend the changes in the river bank are not yet serious enough to require the construction of a new levee there. In fact, in the light of the number of new levees required in the district at this time, the contract for raising and enlarging this levee might even be cancelled.

As reference is quite often made herein to caving banks, and an exaggerated impression might thus be given of the extent thereof, it might be well to state that the length of levee line in the district so far breached and still seriously affected at this time by caving banks is after all only about 10 per cent. of the total length of levee line thus far built in the district.

It should, of course, be the first duty of the district to provide for new levees, where breaches in the line have occurred, or are imminent, but after this has been accomplished, it is to be hoped that means may become available to permit the district to undertake a certain amount of raising and enlarging along particular reaches of the river, notably along certain stretches of the line from the State line to the lower side of Dooley Bayou.

Particulars in regard to this cannot at this date be given, but surveys will be made as soon as the other pressing work at present in hand will permit, and a special report on the subject be submitted.

The camps for the accommodation of the forces of the Board of Control of the State Penitentiary, which are to be employed on the State work at Thompson's, are nearing completion, and the forces are expected to be on the ground to-day.

At this point, a change of location, on account of new conditions, due to the second flow through the crevasse, was rendered necessary and made, materially increasing the contents and cost of the work.

At Magnolia, another one of the levees under construction in the district payable from State funds, conditions have materially improved, and the new levee there is well advanced towards completion.

At Campo Bello, where the new levee work is also payable from funds provided by the State, changes in the location of the line due to further caving, have also been made, considerably increasing the contents and cost of the work there, as well. Work upon this levee, due to abnormal conditions of river and weather, is con-

siderably behind, but will be prosecuted with vigor from this time on.

The contents of the work under way at Thompson's, Magnolia and Campo Bello, to be paid for with funds provided by the State, aggregates about 160,000 cubic yards, costing about $29,000.

Contractors are on the ground at Hurricane Bluff, Long Point, Logie Lea, and Whitehall, and are making fair progress with the forces employed.

The Hurricane Bluff Levee is about completed.

Owing to high water the contractors for the Eric to Buckhall Levee were driven off the ground and have not yet resumed work there, but expect to do so during the course of this week.

On account of washouts some changes in the location of this work are also necessitated, but these will not materially increase the yardage already provided for it.

It is respectfully urged that an active, energetic and competent inspector be employed to supervise and report upon details of construction on the levees below Shreveport, and to enforce the ordinances of the district and the laws of the State governing the care, maintenance and preservation of the levees of the district.

An inspector is already on duty on the line above Shreveport.

Respectfully submitted,

The Board of State Engineers,

Per FRANK M. KERR,

Assistant State Engineer.

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., Sept. 15, 1903.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

SIR—Matters of business here this week of much importance preclude my being present at the meeting of your Board to-morrow, the 16th inst., and, as information relative to the progress of the levee work of the season in your district, and to the condition of the levee line generally, will no doubt be desired, I beg leave to submit the following statement showing the levee work undertaken by the Board of Commissioners of the Caddo Levee District under contracts entered into since February 4th, 1903, and the progress made thereon to date:

Name of Levee	Contents Cu. Yds.	Price Cents	Cost	REMARKS
(Above Shreveport)				
Cavitt.....	100,000	17.40	$ 17,400.00	New levee 10 per cent. of earthwork in position
Wild Lucia.....	78,500	15.40	12,089.00	New levee 95 per cent. of earthwork in position
Hurricane Bluff...	48,434	13.40	6,490.15	New levee. completed
	(226,934)		($35,979.10)	
(Below Shreveport)				
Bagley.....	39,000	16.25	6,337.50	Enlargement 80 per cent. of earthwork in position
Long Point.....	59,094	16.25	9,602.77	New levees, completed
Woodlawn.....	13,166	16.25	2,139.47	Enlargement, completed
Ashwood.....	20,000	16.25	3,250.00	Enlargement, completed
Pascagoula Bayou.	5,600	16.25	910.00	Enlargement, extension to Ashwood contract, completed
Upper Pascagoula.	3,375	16.25	548.44	Enlargement, completed
Logie Lea.....	102.339	16.25	16,630.08	New Levee, extension to upper Pascagoula contract, completed
White Hall.....	30.363	14.69	4,460.32	New levee, completed
Cross Keys.....	94,393	17½	16,518.77	New levee, completed
	(367,330)		($60,397.35)	

RECAPITULATION:

Above Shreveport.....	226,934	Cu. Yds. Costing	$ 35,979.15
Below Shreveport.....	367,330	" " "	60,397.35
Totals..	594,264	" " "	$ 96,376.50

As you may note, the only one of the foregoing pieces of work upon which proper progress has to date not been made is the Cavitt Levee, to which fact the attention of the contractor should be promptly called.

Statement showing levee work undertaken in the Caddo Levee District by the State under contracts entered into since February 4th, 1903, and progress made thereon.

Name of Levee	Contents Cu. Yds.	Price Cents	Cost	REMARKS
Thompson.....	59,743	22¾	$13,591.53	New Levee, Completed $1500 additional paid by Caddo Levee Dist.
Elmer.....	53,000	22¾	12,057.50	New Levee, extension to Thompson contract, completed.
	112,743		$25,649.03	

At this date, February 4th, 1903, the levee district already had under construction a new levee extending from Eric's to Buckhall. The extent of this work, when undertaken, was estimated at 360,000 cubic yards, costing $48,420. On May 6th, 1903, however, the

Board of Commissioners, by resolution, agreed, on account of the absence of means to proceed with other works of more immediate importance in the district, to permit the contractors to temporarily suspend operations on this work, and to measure up and receive all that part of the completed line extending from Station 0 to Station 165+65, and from Station 193+80 to Station 217. These parts of the line were duly completed by the contractors, measured up and received, and a certificate for 226,975 cubic yards issued thereon on June 29th, 1903.

The cost of this work up to that date was, therefore, at the price stipulated in the contract, 13.45 cents per cubic yard, $30,528.13.

At the same date, February 4th, 1903, the State also already had under contract in the district new levees at Magnolia and at Campo Bello. These new levees, amounting to 99,468 cubic yards, and costing $15,160.50, are completed and received, and certificates in final settlement have been issued on them.

With the completion of all the foregoing levee work, the line of public levee upon which the Caddo Levee District is now dependent for protection from overflow will again be continuous from Blanton, Ark., to Gold Point Plantation, above Shreveport, and from the north bank of Bayou Pierre to the lower boundary of the Caddo Levee District below Shreveport.

While much of the line, on account of weeds, the growth of small trees, the wear and tear of time, weather and travel, road crossings and pathways, the rooting of hogs, etc., is not in as good condition as it should be, by far the greater part of it will compare favorably in location, grade, section and appearance with the best in the State.

It seems more than probable, however, at this date, that new levees will be needed in the district at no distant day from Elmer Slough to Coushatta Place, at Cedar Bluff, and at Sterling Bayou, above Shreveport, and at Dixie, Mussers, Upper Magnolia, and lower Cross Keys, below Shreveport.

Among the works of first importance to the district, recommended at the beginning of the season for improvement, was the enlargement of the Simpson Lake Levee. This work has not yet been placed under contract. Every effort should at once be made to do so.

An inspection of the entire line of public levee in the district will be made within the course of the next thirty days, after which a special report will be submitted in regard to the points threatened

by caving banks and such parts of the line as require cleaning off and repairing, with recommendations in regard to the manner in which the work required should be undertaken and executed.

Please advise me of any service desired, and it will be promptly considered and attended to.

Respectfully,

FRANK M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
SHREVEPORT, LA., Dec. 16, 1903.

Hon. W. F. Taylor, President Board of Commissioners, Caddo Levee District, Shreveport, La.

DEAR SIR—I have the honor to report to you at this meeting that all of the levee work undertaken in the Caddo Levee District by the District and the State since the last high water has been completed, with the exception of the Simpson Lake Levee and the Cavitt Levee.

The work required on the Simpson Lake Levee has only just been well started, but with a continuance of good weather it should be completed within the course of a month.

Work on the Cavitt Levee is progressing favorably, and the levee is at this date something more than half completed.

With the completion of these two levees the lines of public levee in the Caddo Levee District, extending from Blanton Bluff to Gold Point, above Shreveport, and from the north bank of Bayou Pierre to the lower end of the District, below Shreveport, will, within their limits, be once more restored to a continuous and efficient grade and section, and will be entitled to rank among the very best in the State.

The wear and tear of time and of the elements, the abuses of man and beast, the burrowing of animals, and the caving of banks are agencies, however, which are ever at work to a greater or less degree, first here, then there, to more or less injuriously affect their integrity.

As it is the duty of your Board to at all times maintain a faithful supervision over the levees of the district, to remedy any and all deteriorations that may develop in the levees, and to correct abuses inflicted upon them, in other words, to preserve their life, I have thought it well at this time to herein again call your attention to the present condition of your levees in certain localities, to-wit:

On the Thompson, Doles, Peru and Egypt places, a burrowing animal, commonly known as the salamander, has attacked the levees in quite a number of places. If not checked in its ravages upon the levees in these localities, the integrity of your lines of protection must eventually be greatly impaired. I am not prepared at this meeting to suggest any effective remedy, and it will be well, it appears to me, for your Board to appoint a committee to look into the subject and report at your next regular meeting.

The woods for quite a distance above and below Dooley Bayou, above Shreveport, and at the Bagley and Riverdale places, below Shreveport, closely hug the line of levee, keeping it shaded to the detriment of its sod, inducing the growth of weeds, briars, etc., and rendering the levee liable to injury from falling timber. Along all these stretches the timber should be slashed for a distance of 100 feet each side of the line, and the levee cleaned off, repaired and re-grassed.

Weeds, briars, small trees, etc., have been permitted to grow on quite a number of stretches of levee in the District, notably on the lower part of Missionary, Dooley Bayou, Peru, Cedar Bluff, and Crescent Place, above Shreveport, and at Dixie, below Shreveport. These lines of levee should be cleaned off and properly repaired and re-grassed.

Since the subsidence of the last high water, no serious changes in the river bank above occurred along the front of your district, but with a return of high water, considerable changes may be looked for at a number of places, notably from Elmer Slough to Coushatta Place, at Cedar Bluff, Sterling Bayou, Dixie, Riverdale, Long Point, Mussers, Magnolia, and lower Cross Keys.

Should levees become necessary in the near future at all of these points, as seems likely, the District would have to provide for the construction of some 600,000 cubic yards of earthwork.

Provision should, too, at the earliest possible time, within the means of the District, be made to raise and enlarge the present line of levee from Blanton Bluff to Scott's Slough, above Shreveport, and at Rush Bayou, below Shreveport, involving about 200,000 cubic yards of earthwork, not to mention the extension of the levee line from Gold Point south towards Shreveport, upon which a special report has already been submitted.

Respectfully,

The Board of State Engineers,

Per FRANK M. KERR,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Aug. 21, 1902.

Hon. J. W. Jeter, President Board of Commissioners, Bossier Levee District, Shreveport, La.

DEAR SIR—An inspection of the entire line of levee in the Bossier Levee District was made during the past week, and the following report in regard to the condition of the line, with recommendations, is respectfully submitted for your early consideration, viz:

Willow Bend.—Upper portion repaired last season by the State, to remedy the burrowing of salamanders, somewhat worn and disfigured in places by rain wash, but section generally full. Grass, however, has not yet spread well, and levee getting very weedy. Lower portion section full, but generally weedy, parts of line obscured by weeds.

Lassiter's.—Upper portion, section full and well grassed, but lower section mostly obscured by weeds, vines, briars, etc.

Rough and Ready.—Section worn and ragged in places, but generally full and well grassed, though weedy in spots. Defective ramps at upper and lower limits. Caving continues all along front, but width of batture safe at this date—not less than 400 feet anywhere.

Willow Chute.—Section somewhat worn and ragged, at crossings over old river dike, at upper end, but generally full, clean and well grassed. Caving opposite lower arm of old river (Willow Chute) serious, and a new levee covering threatened breach in line required.

Honey Grove.—Section generally full, though somewhat ragged in places. Well grassed, though very weedy along a portion of the line. Fence posts have been recently imbedded in levee at line between Honey Grove and Gordy Ogden's, and should be removed.

Gordy Ogden's.—Except for the stretch of levee above the new levee of 1901, section full, clean and well grassed. This stretch is ragged in places and obscured by weeds.

Gold Point.—Section full and well grassed, though somewhat weedy in spots.

Riverside.—With exception of upper wing, section full and well grassed, though weedy in spots. Upper wing ragged, obscured by weeds, and scantily grassed.

Buckhall.—Section mostly full and well grassed, but generally weedy. Encroachment of bank along stretch of levee in front of residence and improvements, increases slowly, and the construction of a new levee here cannot be deferred much longer.

Cash Point.—Section full and well grassed, but generally weedy. Parts of line obscured by weeds. Defective ramp at angle in point, and at approach to ferry opposite upper side of public lane. Caving continues along upper and lower sides of point, but width of batture safe at this date.

Shady Grove.—Section full and well grassed, though somewhat weedy in spots.

Benoit Bayou.—Section full and well grassed, but very weedy. Caving continues and considerable changes in bank may be expected, unless cut-off through Southside occurs.

Pandora.—Section full and well grassed, but somewhat weedy in spots. Defective ramp near gin. Caving at upper end continues, but width of batture safe at this date.

Carmouche.—Section low and scant as compared with line above and below. Otherwise clean and well grassed. This line of levee should be raised and enlarged as son as means are available.

Jeter's.—Section full and well grassed, though weedy in spots.

Colquitt's.—Section full, clean and well grassed, except in vicinity of residence, where levee is very weedy.

Pat Cash's.—Upper portion, section full and well grassed, but quite weedy. Caving in bend continues, but width of batture safe at this date. Lower portion, unimporved levee; section scant, ragged, and obscured by weeds. No recent material changes in bank. Line should be improved as soon as means are available.

Hollingsworth's.—Section generally fair, though somewhat reduced and disfigured by rain wash after completion. Well grassed, but weedy and unkept in appearance. Defective ramp at lower end.

Dillard's.—Upper portion of line, section good, clean and well grassed. Lower portion, section good and well grassed, but weedy in spots. Defective ramp opposite improvements.

Bossier City to Dillard's.—Section generally good, but ragged in spots and weedy. Several pathways through levee.

Bossier City.—Section generally full, but lower half, occupied by railroad switch, weedy and unkept, and upper half being gradually crowded by bridges and waste to sawmills and box fac-

tories, all of which must eventually prove injurious to levee and render it unsafe.

Bossier City to Vinson Bayou.—Section full, clean and well grassed, except on lower wing, which is very weedy. Defective ramps next to railroad embankment and on upper side of Vinson Bayou.

Vinson Bayou to Alexander and Blanchard's.—Section full, but overgrown with weeds, vines, etc. Deep pathway just below over bayou just below Belcher residence.
ever bayou just below Balcher residence.

Alexander and Blanchard's.—Section largely deficient from hog roots, and encroachment of road upon levee. Two deep pathways through levee, and entire line overgrown with weeds, brush, vines, etc.

Mack's Bayou to Schenick's Bayou.—Section full, clean and well grassed. Banquette across Mack's Bayou, however, much worn down by travel.. Dangerous road gap through levee just above dike across Mack's Bayou.

Chalk Level.—Section full and well grased, but lower half of line very weedy. Caving from just below Schenick's Bayou to point opposite residence continues, but width of batture apparently safe at this date.

Clay Place.—Section full and well grassed, but weedy in spots. Defective road crossing opposite horse lot, and two deep pathways through levee.

Nicholson's.—Section generally full, clean and well grassed. Banquette across old crevasse much worn and disfigured by travel. Caving continues near upper line, but width of batture safe at this date.

Upper Sunflower.—Section full, clean and well grassed. Two deep pathways through levee. Caving continues near lower line, but width of batture safe at this date.

Lower Sunflower.—About one-half of length of line in fairly good condition, balance somewhat ragged and scant in section, slope on land side generally only 2 to 1, except on new levee above Curtis. A number of pathways through levee.

Curtis.—General condition of line fair, though ragged in spots, from wave wash, hog roots, and encroachment of road. Clean and well grassed. Couple of pathways through levee, and one road cut, with defective ramp. Slope on land side only 2 to 1.

Richmond Bayou.—Section full, clean and well grassed. Banquette across upper bayou (Charles Bayou) scant and narrow.

Pruitt's.—Section full, clean and well grassed. Caving continues in bend and along lower reach, but width of batture still safe at this date.

Hall's.—Across Point: Section full and well grassed, but weedy. New Levee; lower side of Point: Section full, but obscured by rank weeds.

Childer's.—Section full and well grassed, but a large part of line very weedy.

Scopini.—Section full, clean and well grassed. Caving continues, but width of batture still safe for some time to come.

Grappe Place.—Section full, clean and well grassed.

Phillip's Place.—Section full, clean and well grassed.

Ash Point (Dortch).—Section full, clean and well grassed. Caving serious but width of batture safe at this date—not less than 250 feet at any point. Defective ramp opposite residence.

Mercer's.—Line generally in good condition, clean and well sodded, but somewhat scant in section and ragged in appearance in vicinity of residence. Defective ramps opposite residence and gin house.

Waterloo.—Section full, clean and well grassed.

Magenta.—Section and condition generally good, but a large part of line very weedy. Defective ramp opposite store.

Gold Dust.—Section full, clean and well grassed. Caving serious and new levee required. Least width of batture at this date 125 feet.

Hopewell.—Section full, clean and well grassed. Caving serious and new levee required. Least width of batture at this date 97 feet.

Elm Grove.—Section full, clean and well grassed. Considerable caving but width of batture still safe at this date.

Whitehouse Place.—Section full and well grassed, but somewhat weedy in places. Two pathways through levee and one defective ramp near residence.

Bates.—Section full, clean and well grassed. No material changes in bank.

Knox Point Place.—Section generally full and well grassed, but somewhat weedy. Defective ramp back of site of old store, and levee somewhat ragged and scant in places for short distance above. Caving continues, but width of batture still safe at this date.

Knox Point Place to Lovely Point.—Except for stretches at upper and lower limits, section full, clean and well grassed. For about 1,000 feet below upper limit, somewhat ragged and worn, especially opposite store and barn, and line weedy. For about 1200 feet above lower limit, section full, but obscured with vines, weeds, etc. One defective ramp.

Lovely Point.—Section full, clean and well grassed. Model looking levee. Considerable caving along lower side of Point—width of batture not more than about 200 feet for quite a stretch about 1,000 feet above gin. Defective ramp opposite residence.

Glenwood (A. J. Moss).—Section generally full. About 300 feet at lower and somewhat disfigured from hog roots. A few bald spots on surface, but line generally fairly clean and well grassed. Slopes disfigured in spots by old pathways and rain wash. Defective roadway near lower line.

China Grove.—Section generally full, clean and well grassed, though there are some bald and ragged spots here and there, especially opposite site of residence. Deep pathways through levee just below lane. Defective ramp in lane and levee much worn by crossings.

From China Grove to Christiana.—Section full, but, though well grassed, weedy and considerable growth of small cottonwood trees. One deficient road crossing and two pathways.

Christiana.—Section full, clean and well grassed, except along stretch above point, where levee is weedy and there is a considerable growth of small cottonwood trees. Defective crossing near upper end of place, and pathway in angle at upper spur. Serious caving along lower side of point, and new levee required.

Sixteenth Section.—Section generally full, though well grassed, weedy and overgrown with young cottonwood trees in places. One defective roadway.

Buckhorn.—Section generally full, clean and well grassed. Caving opposite Campo Bello cut-off continues serious, but width of batture still safe at this date—least width 500 feet.

Bear Point.—Section full and well grassed but weedy in places.

The lower end of the line of public levee in the Bossier Levee District is, at this time, located on lower bank of Ninock Lake, on the Dennison Plantation, leaving still an unleveed length of line from that point to the lower boundary of the district of about five miles by river.

The recommendations of the Board of State Engineers in regard to new levees, enlargement and repairs required, named in the order of their relative importance, are submitted as follows, viz:

(1) NEW LEVEES REQUIRED.

1.	Willow Chute, about.....	25,000	cubic yards.
2.	Gold Dust, about.....	35,000	" "
3.	Hopewell, about.....	35,000	" "
4.	Christiana, about	20,000	" "

(2) ENLARGEMENT REQUIRED.

1.	At Pandora, about.....	15,000	" "
2.	At Pat Cash's (partly new levee and partly enlargement) about	30,000	" "

(3) REPAIRS REQUIRED.

The line, as shown in the foregoing description, requires cleaning off in many places, on account of weeds, brush, bushes and other growths, and a good deal of it has been either impaired, reduced in section, cut through by roadways and pathways, or disfigured by hog roots and the encroachment of the public and private roads upon its base.

Methods and means should be promptly devised by your Board to remedy these defects.

Respectfully submitted,
The Board of State Engineers,
Per FRANK M. KERR.
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Dec. 29, 1902.

Hon. W. B. McCormick, President Pro Tem. Board of Commissioners, Bossier Levee District, Shreveport, La.

DEAR SIR—Having been advised by you that a special meeting of the Board of Commissioners of the Bossier Levee District had been called to meet at Bossier City on Tuesday, December 30, 1902, at which it was desired that I should be present, I take it for granted that a preliminary report, touch upon the recent high water in Red River, its effect upon your levee line, and the immediate require-

ments of the district in consequence thereof, will be expected at this meeting from this department, and, therefore, beg leave to submit the following, based upon a reconnaissance of the line of levee in the district at about the time of the highest water.

Opportunity and time to obtain the necessary information to permit exact statements have not yet been given, but, along the front of the Bossier Levee District it can be safely estimated that the high water of December, 1902, compared in height with the high waters of the past in Red River, about as follows:

(1) From the upper end of the district (Willow Bend Plantation) to the vicinity of Rough and Ready Plantation, it was somewhat higher than the high water of 1894—the highest of previous record for that part of Red River.

(2) From the vicinity of Rough and Ready Plantation to the vicinity of Shreveport, about equal to the high water of 1894, which, at Rough and Ready Plantation and at Shreveport, was about 1 foot lower and at Pandora, about midway, about 4 feet lower than the high water of 1892—the highest of record for that part of Red River.

(3) From Shreveport to the vicinity of Curtis' Place, somewhat lower than the high water of 1894. On this part of Red River the high waters of 1894 and 1892 were, generally, about equal in height, and were the highest of record.

(4) From the vicinity of Curtis' Place to the vicinity of Knox Point, somewhat higher than the high water of 1895—the highest of previous record for that part of Red River.

(5) From the vicinity of Knox Point to the lower end of the district, about equal to that of 1892—the highest of record for that part of Red River.

In spite of the extreme height of the water thus generally prevailing in the river along the leveed front of your district during this period, upon but one stretch of your line did the river threaten to overtop the levees. This was upon what is known as the Dortch-Mercer Levee, where some raising and backing was done, in short lengths, aggregating about one quarter of a mile in length. Comparing this with the total length of your levee line—at this time about 58 miles—the very extraordinary showing follows that less than one-half of 1 per cent. of your levee line was at any time in danger of being overtopped by the river. All other parts of the line stood from 2 to 6 feet above it.

While seepage was, as is usual, during high water, general, and at some points very pronounced, at no point did it grow serious enough to call for any special efforts to check its effects.

Excessive caving, however, occurred at quite a number of places, notably at Willow Chute, Gold Dust, Hopewell, Christiana and Buckhorn, and gave cause for grave apprehension for the safety of the levee lines there.

At all of these places the existing levee appeared at a number of times during the period of high water, threatened by breaches from the caving of the river bank, and at Willow Chute, Christiana and Buckhorn, provision had to be made for run-rounds in anticipation of such an emergency.

The stage of the water in Red River, though steadily declining, is still high, and you will, therefore, understand that further developments are more than likely to occur which might materially affect any statement now made in regard to the immediate requirement of the district, but, even at this time, the following is self-evident: The early completion of the new levees at Willow Chute, Gold Dust, Hopewell and Christiana, and provision for a new levee at Buckhorn, and for raising and enlarging the Dortch-Mercer Levee.

The new levees at Willow Chute and Christiana have already been provided for by the district, and those at Gold Dust and Hopewell by the State, leaving, therefore, among the requirements above stated, only the new levee at Buckhorn, and the raising and enlargement at the Dortch-Mercer Levee to be immediately considered by your Board.

On account of the caving of the river bank at Willow Chute, a change in the location of the new levee, under contract there, was necessitated, but the additional yardage required in consequence of the change will not exceed 5,000 cubic yards.

For the construction of the new levee at Buckhorn not more than about 25,000 cubic yards of earthwork will be required.

To raise and enlarge the Dortch-Mercer Levee will require about 60,000 cubic yards. However, on account of caving, it may, upon further examination, prove advisable not to raise and enlarge that part of the line extending along the upper part of the Dortch Place, and a new levee there would increase the yardage for this line to about 140,000 cubic yards.

The aggregate of this immediate work is, therefore, only about 170,000 cubic yards. But, if the new levee at Dortch's can be delayed, provision for only about 80,000 cubic yards is necessary.

When, however, more time has been afforded for future developments, in the near future, at these and other places in the district, and the necessary examinations and surveys have been made, the requirements of the district may certainly be estimated to greatly exceed the quantities here given, it being, at this time, alone evident that new levees should be built at Buckhall and Gilmer Lane above Bossier City, and that the Scopini Levee, below, should be raised and enlarged.

Very respectfully submitted,

The Board of State Engineers,

Per FRANK M. KERR,

Assistant State Engineer.

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., May 4, 1903.

Hon. W. B. McCormick, Prest. Board of Commissioners, Bossier Levee District, Shreveport, La.

DEAR SIR: The levee work recently completed, and still under contract, in the Bosier Levee District, payable from funds to be provided by the district, is as follows:

Name of Levee.	Contents, cubic yards.	Price per cu. yd.	Cost.	Remarks.
Willow Chute, N. L...	23,547	13.90	$ 3,273.02	Final Cert. issued.
Buckhall, N. L.....	18,227	15.69	2,859.81	Final Cert. issued.
Dortch, N. L.....	110,000	17.80	19,580.00	Under way.
Mercer En'l'g't.....	30,000	16.70	5,010.00	Not yet begun.
Christiana, N. L.....	21,370	13.37	2,857.16	Final Cert. issued.
Buckhorn, N. L.....	22,450	15.90	3,569.55	95% done.
	225,594		$37,149.55	

The levee work under contract in the district at this time, payable from funds to be provided by the State, is as follows, viz:

Name of Levee.	Contents, cubic yards.	Price per cu. yd.	Cost.	Remarks.
Gold Dust	75,000	15.45	$11,587.50	75% done.
Hopewell	85,000	15.45	13,132.50	35% done.
	160,000		$24,720.00	

Additional levee work is now required in the district, as follows, viz:

Name of Locality.	Contents, Cu. Yds.	Remarks.
Rough and Ready	55,000	New Levee.
Pat Cash's	30,000	New Levee and Raising and Enlgt.
Scopini	80,000	New Levee.
Dortch Extension	145,000	New Levee.
Van Hoose	50,000	New Levee.
Total	360,000	

All of this work has become necessary in consequence of caving banks.

At Rough and Ready, the caving bank has fortunately worked down stream. Along that part of the river bank opposite the lake the extent and rate of caving has materially diminished, and conditions along there have greatly improved, but from the angle in the levee below the lake down to a point near Old River, conditions have grown more serious, the distance between the centre of the levee and the river bank, at one point, being only 150 feet, with every indication of continued extensive caving.

At Pat Cash's the river bank has caved into the slope of the levee, at the angle just above the negro church. The bank along here is, however, high, and it requires an acute stage of water in the river to even cover it, so that in view of the present limited means at the disposal of the district for other more important work, the construction of a new levee here might be temporarily deferred.

At Scopini, extensive caving occurred during the high water of last December and March, the distance between the centre of the levee and the river bank being now reduced at one point—opposite the crevasse hole—to only 215 feet. The levee which is threatened here is on the concave side of a bend along which continued caving may be expected.

The importance to the Bossier levee district of maintaining this line is too well understood to require any special argument.

At Dortch's, the caving which developed during the high water of December, was greatly increased during that of March, extending up stream to a point opposite the lower tangent of the U. S. Scopini levee, where the distance between the centre of the levee and the river bank is now only 75 feet.

A breach in the line of levee here would result as seriously to the district as one in the Scopini levee.

At Van Hoose's, the distance from the centre of the levee to the river bank is, in several places, not more than 100 feet.

The bank along the levee line at Van Hoose's has been caving slowly for quite a while past, but has recently been greatly increased by the presence of a cut-off across the lower neck of Parcagoula Point, which occurred during the high water of March.

Continued serious caving may be expected here, extending on up into Elm Grove.

In consequence of the number of new levees thus required in the district, and others which may still become necessary, the Board of State Engineers would suggest the temporary withdrawal from the contract of the enlargement work at Mercer's (30,000 cubic yards).

The Board of State Engineers is pleased to be able to announce, also, that it has been found possible for the State to undertake the construction of the new levee required at Van Hoose's, in addition to that under way at Gold Dust and Hopewell.

The Board of State Engineers selects the new levee at Van Hoose's for construction by the State, as the cost will just about come within the amount of its funds still available at this time for the Bossier Levee District, and because it is expected to arrange to have it built as an extension to the Gold Dust Hopewell contract, already under way in the district, and but a short distance above it.

Temporarily deferring the construction of the new levee at Pat Cash's (30,000 cubic yards), withdrawing the enlargement of the Mercer Levee from contract (30,000 cubic yards), and the State undertaking the construction of the new levee at Van Hoose's (50,000 cubic yards), the number of cubic yards of earthwork for which the district is called upon, at this time, to provide, is, therefore, reduced from 360,000 to 250,000 cubic yards.

The care and preservation of the levees in the district is still not receiving proper attention from the authorities, and unless intelligent and systematic measures are soon inaugurated to check the abuses to which the line is in many places often subjected and to repair deficiencies already caused by abuses and the wear and tear of time, its security as a whole cannot long be relied upon.

Respectfully submitted,

The Board of State Engineers,

Per FRANK M. KERR,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
ALEXANDRIA, LA., May 14, 1903.

Hon. J. G. White, President Board of Commissioners, Red River, Atchafalaya and Bayou Boeuf Levee District, Alexandria, La.

DEAR SIR: Assuming that it would prove interesting to you and the members of your Board, at the meeting to be held this evening, to receive some statement from the Board of State Engineers in regard to the high water of this year in the streams affecting the district, the good service rendered by the levees, and the additional requirements of the district at this time for the further betterment of its levees, the following is respectfully submitted:

On Red River—At Alexandria, the water reached a height within two feet of that of 1892, the highest water of record at that point; from Alexandria to Egg Bend, this difference gradually diminished to a stage about equal to that of 1892; from Egg Bend to David's Ferry, the high water of 1892 was gradually exceeded until at David's Ferry it was about a half a foot higher; at its mouth, Red River was somewhat lower than the high water of 1897, the highest of previous record there.

On Bayou des Glaizes—The high water of this year reached a height within about three-quarters of a foot of 1897, at Moreauville, to within about a quarter of a foot at Simmsport, at which point the high water of 1897 was two feet and a half higher than any water of previous record.

On the Atchafalaya River—The high water of this year varied from a height about a quarter of a foot below 1897, at Simmsport, to a height two feet and six-tenths higher than 1897, at Melville.

Notwithstanding this high stage of water against its long lines of levee, extending over a period of four months, the district was at no time during this period given any serious cause for apprehension for its safety from overflow.

The new work undertaken last summer on the Atchafalaya River, below Bayou Petite Prairie, as an extension to the system on the Atchafalaya River, was unfortunately unfinished at the time of the advent of the high water of this year, and much of the earthwork in position at the time was washed away, deferring the benefits to that part of the district which the completion of the work should afford.

The enlargement work undertaken by the State at Bordelonville, just before high water, was interrupted, but without loss, and the work is about to be resumed there this week.

The grades of the lines of levee in the district were shown by the high water of this year to afford good margins of safety for such waters as the district has so far experienced, except at the following named places, viz: Sunny Home and Avoyelles Dyke, on Red River, and at Green's Store, Elba and Melville, on the Atchafalaya River.

These levees should be raised and enlarged to standard grades and sections.

Much of the line on Red River is still smaller in cross-section than desirable. These points of the line should receive attention as soon as the means can be spared for that class of work.

From observations made on inspections during the period of high water, attention is called to the following places specially:

On Bayou Rapides—Road cuts where public road crosses levee, opposite Ball's, and where the St. Louis, Iron Mountain & Southern and the Texas & Pacific Railroads cross the public levee: defective drainage and serious seepage head of Fourth, Fifth and Sixth streets.

On Red River—Abuses to levee along entire city front. Erosion of river bank opposite Jackson street, and settling bank opposite Rodger's.

Parish Farm—Salamander holes and defective drainage.

Hudson's—Levee at one point battered, ragged and reduced in section by cattle crossing and herding on it. Considerable seepage and defective drainage.

Hathorn's (Below Cut Off Bayou)—Leak.

Duncan's—Levee battered, ragged and reduced in section from abuse

Willie Wilson's—Cherokee rose trees starting to grow over slope. Dangerous road cut.

Jack Wilson's—Levee around "water hole" small in section as compared with balance of line; seepage considerable; no very alarming indications during this high water, but at any much higher stage might give trouble. A banquette should be extended along this part of the levee.

Once More—Dangerous road cut.

Once More to Echo—Several dangerous pathways.

Echo—Banquette across bayou badly worn from use and abuse. Dangerous road cut opposite gin, and platform over levee.

Gueringer's—Dangerous road cut.

Egg Bend—Dangerous pathway and road cut.

Bringol.'s, Overton's, etc.—Several old stump holes near base of levee on land side. Should be cleaned out and filled and tamped.

Normand's—Large stump hole in land edge of base of levee, between Normand's and Guyot's. Levee in front of Guyot's house badly worn. Stump hole should be cleaned out, filled and tamped, and levee repaired.

Cyrille Laborde's—Levee badly worn in front of residence and store. Dangerous road cut back of gin—head of lane.

Choctaw Bayou—Banquette considerably worn, and defective ramp just below dyke. Banquette should be repaired and ramp improved.

On Bayou des Glaizes—A number of pathways and road cuts, and two or three pipes through levee. The exact location of these cannot at this time be stated.

On the Atchafalaya River—Several pathways and road cuts.

Bayou Rouge Dyke—Slope of banquette, on land side, sloughed to some extent during high water. Dyke should be raised and enlarged, and an additional banquette built across bayou on river side.

Along greater part of line on *all* streams, defective drainage,

The drainage work in the district was several times interrupted during the winter, on account of the extreme stages of rain water in the basins which prevailed from time to time, and hence is not as well advanced as it should otherwise be.

Fair progress is, however, again being made, and works Nos. 2, 3 and 5 should be completed during the course of this summer.

With the fact of the destruction of Work No. 1, Lamourie Dam, forming part of the project for improving drainage from Alexandria to Bayou des Glaizes, effected during the past week by parties regarding it as an obstruction to the drainage of Bayou Bœuf, you are already fully informed.

The investigation of the extent of the influence of this dam over the drainage of aByou Bœuf, requested by your Board at a former meeting has not yet been made by the Board of State Engineers. This will, however, be undertaken as soon as the more

pressing levee work of the State, and local conditions on Bayou Bœuf will permit, and a special report on the subject submitted.

Respectfully,
The Board of State Engineers,
Per FRANK M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Oct. 6th, 1903.

Hon. J. G. White, Prest. Board of Commissioners, R. R. A. and B. B. Levee District, Alexandria, La.

DEAR SIR: In compliance with the request of your Board, expressed at a meeting held on March 3rd, 1903, the Board of State Engineers has the honor to, herein, submit its opinion as to whether the congested stage of water in Bayou Bœuf, during the months of December, January and February last, "was due to the Lamourie Lam, or to the excessive rainfall," during that period. Some loss of time has been experienced in obtaining certain data, hence the late date at which this report is submitted.

The Lamourie dam was constructed by your district as a part of a plan for improving drainage from Alexandria to Bayou des Glaizes, recommended by the Board of State Engineers. The dam was completed and received on April 1st, 1901. The other parts of the plan for improving drainage, between the points named, have not yet been completed.

The closure of Bayou Lamourie, at the point of its departure from Bayou Bœuf, was recognized by the Board of State Engineers as a very desirable adjunct to the plan for improving the drainage in question, as it would separate the basin into two independent drainage channels, divide the service imposed, and materially reduce the cost of one route, without apparent prejudice or injury to the other.

In other words, it was thought well to relegate to Bayou Bœuf the duty of carrying the drainage of the territory west of it, and upon the proposed artificial and improved channels from Alexandria to Bayou des Glaizes that of disposing of the surplus rain water falling within the territory lying between Bayous Roberts and Bœuf and Red River.

The constantly increasing tendency of Bayou Lamourie to enlarge, and of Bayou Bœuf, in consequence of the large flow there-

by diverted from it, to diminish in section, made it evident that, sooner or later, Bayou Lamourie would become the main artery for drainage to the territory west of Bayou Bœuf to the detriment of the territory between Bayous Roberts and Bœuf and Red River, unless the drainage channels therein proposed should be designed and constructed to meet the double servitude.

The cost of closing Bayou Lamourie dam was estimated at not exceeding $1,500, which the extension and enlargement of the proposed canals to dimensions necessary to additionally take care of the flow from Bayou Lamourie was estimated to add not less than $50,000 to the cost of the project in which its closure constituted part of the plan.

As a matter of fact, the Bayou Lamourie dam, and the siphon placed over it, as an act of grace to the people living along its banks, who feared that their supply of good water for stock and domestic purposes would be jeopardized by the closure of Bayou Lamourie, cost only $1,958.84.

The difference in cost between the two propositions thus presented, naturally resulted in the adoption of that contemplating the closure of Bayou Lamourie.

From the first day of April 1901, to the first day of December, 1902, a period of twenty months, during which Bayou Lamourie remained closed, no serious complaint at any time arose in regard to the stage of water in Bayou Bœuf. On the contrary, everyone on Bayou Bœuf seemed well satisfied with the situation, and on Bayou Lamourie conditions were regarded by all concerned as rather ideal, compared with any experience of the past.

The assertion has been made by parties, whose opposition to the dam across Bayou Lamourie afterwards developed, that the rainfall in the basin affecting Bayou Bœuf, during this period, was much below the average.

This statement is not borne out by the records of the U. S. Weather Bureau, which show that the rainfall from December 1st, 1900, to December 1st, 1901, at Alexandria and Cheneyville, was 51.91 inches and 41.70 inches, respectively, from December 1st, 1901, to December 1st, 1902, it was 19.79 inches and 43.25 inches, respectively.

The average annual rainfall at Alexandria for ten years, from 1892 to 1902, the latter inclusive, was 53.7 inches. At Cheneyville, the record for ten years is incomplete, but the average for the years 1895, 1896, 1897, 1898, 1901, and 1902, was 46.4 inches.

Deduction from this, however, is not altogether to the point. It is not the ordinary rainfall delivered in showers during the twelve months of the year that cause congestions in streams, but the continuous heavy downpours occurring during the short wet seasons peculiar to localities, at times.

The wet season in the basin in question occurs usually during the months of December, January, February and March.

The closure of Bayou Lamourie followed the wet season of December, 1900, to March 1901, inclusive, and it remained closed during and following the wet seasons of December, 1901, to March, 1902, inclusive, and December, 1902, to March, 1903, inclusive.

The records of the U. S. Weather Bureau, for Alexandria and Cheneyville, for these three wet seasons, show the following:

Alexandria.			Cheneyville.		
Year.	Month.	Precipitation inches.	Year.	Month.	Precipitation inches.
1900	December	4.81	1900	December	6.26
1901	January	4.74	1901	January	3.38
1901	February	6.77	1901	February	5.91
1901	March	4.10	1901	March	3.53
	Total	20.42		Total	19.08
1901	December	8.92	1901	December	7.55
1902	January	1.68	1902	January	2.14
1902	February	4.06	1902	February	4.10
1902	March	2.66	1902	March	3.25
		17.32			17.04
1902	December	4.37	1902	December	5.04
1903	January	5.61	1903	January	4.97
1903	February	13.87	1903	February	14.28
1903	March	9.10	1903	March	11.59
		32.95			35.88

The precipitation for the first two wet seasons, as shown above, may be classed as about equal to the average, while that for the third was certainly abnormal.

During the first two, no ill effects were felt from the closure of Bayou Lamourie, but during the third a serious condition of affairs no doubt existed along certain parts of Bayou Bœuf.

It is, therefore, the opinion of the Board of State Engineers that the congested stage of water in Bayou Bœuf during the period referred to was due to excessive rainfall just preceding and following that period, aggravated by the closure of Bayou Lamourie.

In this connection, the Board of State Engineers would further report:

On the night of May 10th, 1903, through the lawless action of a number of unknown parties, the dam across the head of Bayou Lamourie was destroyed, and within three weeks thereafter the stage of water in Bayou Bœuf, at the head of Bayou Lamourrie, fell about 5 feet, materially reducing the extent of its encroachment upon the low lands contiguous to Bayou Bœuf, and up to this time inflicting but little damage to those on Bayou Lamourie and the basin below. The total fall before this occurred, from the highest stage of water reached in Bayou Bœuf, was about three feet.

It must, however, be borne in mind, that the rapid relief to Bayou Bœuf apparently afforded by the destruction of the Bayou Lamourie dam occurred at a time when the precipitation in the basin had been very light for fully sixty days previous to May 10th, 1903, and continued so for quite a while afterwards.

With a continuance of the conditions which existed in December, January, February, and March, preceding, the effect on Bayou Bœuf would undoubtedly have been much slower and far less pronounced.

The destruction of the dam across the head of Bayou Lamourie introduces, at a late date, a condition for which provision was not made in the project designed for improving drainage from Alexandria to Bayou des Glaizes, and leaves the latter incomplete. The question of the advisability and propriety of rebuilding the dam, or of providing for the additional servitude, which the artificial channels may be called upon to give, is, therefore, before your Board.

So far, no materially injurious effects upon the basin around Chatlin's Lake, and below, is appreciable. It is, however, probably premature to pronounce upon the question, and it may be well to await developments.

It is, therefore, recommended that any further steps in the premises be deferred until a longer period of time be permitted for a closer study of the situation and its effects.

Respectfully,

The Board of State Engineers,

FRANK M. KERR,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Oct. 9th, 1903.

Hon. J. G. White, Prest. of Board of Commissioners R. R. A. and B. B. Levee Dist., Alexandria, La.

DEAR SIR: In compliance with your request of May 14th, 1903, to investigate and report upon the advisability of extending the line of improved public levee on Bayou des Glaizes, above its present terminus, that is, above the lower end of the Moreauville Lane, as petitioned for by a committee of citizens of Avoyelles Parish, the Board of State Engineers has the honor to recommend that the line be extended, for the present, to a point about one and a half miles above Moreauville.

Above this point, owing to the extension and improvement of the levee lines on Red River and the Mississippi River, and the consequent abatement of serious overflows from those sources, none of the high waters on Bayou des Glaizes since 1882 have reached elevations, except on short stretches, in 1897, much if at all above the natural surface of its banks.

Any extension above this point may, therefore, await further developments.

The number of cubic yards of earthwork required to extend this line of levee, as described, is about 50,000.

Respectfully,
The Board of State Engineers,
Per F. M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Oct. 2nd, 1902.

Hon. Leon Wolff, Prest. and Members of the Board of Commissioners, Courtableau Levee District, Washington, La.

GENTLEMEN: Pursuant to the requirements of Act No. 166 of the General Assembly of 1902, creating the Courtableau Levee District, I have the honor to inform you that the Board of State Engineers has designated me to attend this meeting of your Board.

As a preliminary report, I have the honor to submit the following:

A line of levee on the south bank of Bayou Courtableau from Port Barry to its mouth, on a basis of say 5 feet of average height, with a crown of 8 feet and slopes of 3 and 3 to 1, would take about

450,000 cubic yards of earth, and at the price at which work is now being done on both sides of the Atchafalaya River, would aggregate an average of about 20 cents per cubic yard, and cost about $90,000. A line of levee on the Atchafalaya River, on the front of your district, at a grade of about 5 feet above 1897 water, would require a levee about 7 feet in height, and contain about 250,000 cubic yards. On the same basis of price, this would cost $50,000, or the grand total necessary to complete a levee system such as is contemplated in the Act would amount to about $140,000.

The question of keeping a line of levee on the south bank of the Courtableau intact after its construction would be indeed a serious one, as the Red River, Atchafalaya and Bayou Bœuf District is steadily extending its line of levee on the Atchafalaya, and any crevasses occurring above, either on Bayou des Glaizes or on the Atchafalaya, would have the effect of piling up water on the south bank levee to a considerable height above the water level of the Atchafalaya at the mouth of the Courtableau.

In addition to this, the small territory embraced within your district would hardly justify the expenditure of so great an amount of money for the completion of an extensive levee system which would contain practically three-quarters of a million cubic yards of earthwork, at an expense of not less than $140,000.

A line of levee contemplating the closure of the Courtableau at its mouth and an extension of a system of levees to the lower line of St. Landry Parish, would only cost you one-third of the amount required for the construction of the combined system and would, in the opinion of the Board of State Engineers, give you a permanent and complete system of levees whenever the Red River, Atchafalaya and Bayou Bœuf Levee District extends its line to the mouth of the Courtableau, which project is now in the course of successful completion. Within the last two years, this district has extended its system to within about 10 miles of the Courtableau, and is still extending it. They have improved their levee system since the high water of 1897 to such an extent as to be able now to prosecute this work—which is as important to them as to you—more rapidly than ever before.

The report of H. C. Collins, U. S. Asst. Engineer, on the survey of the Courtableau in 1879 is respectfully submitted to you, also that of the same engineer in 1883-84, and of Lieut. Crosby in 1896, and of Major Adams in 1901.

You will find that after many attempts to keep open Little Devil Bar to navigation, Major Adams has finally reported that

Bayou Courtableau is only navigable in high water. The same thing might be said of any road or trail cut through the woods and the stumps and trees removed. Therefore, after the expenditure of $57,800 by the Government, at the mouth of Bayou Courtableau, to remove the bar and improve navigation, it has practically abandoned the idea; and as a matter of fact, notwithstanding the expenditure during a period of 8 years, of something like $57,800, the bar at the mouth of Bayou Courtableau has extended up the bayou from a distance of 6,200 feet in 1879 (See H. C. Collin's report) to 14,800 feet in 1896 (See Lieut. Crosby's report) and in 1900 to 16,000 feet, as was observed by Mr. Kerr and myself on an inspection in October, 1900. Throughout the whole distance of this bar there is such a collection of snags, driftwood, etc., that it is not practical to open it again for navigation.

A large part of the richest portion of the Parish of St. Landry is now practically unprotected from overflow. A judicious expenditure of your revenues and the united efforts of yourselves, the Commissioner from St. Landry to the Red River, Atchafalaya and Bayou Bœuf Levee District, and co-operation with the citizens of St. Martin Parish, in urging the Atchafalaya Basin Levee District to join you in the extension of your levee system, would result in a continuous line of levees from Moreauville, on Bayou des Glaizes, to Butte la Rose, on the Atchafalaya, and bringing into cultivation a vast area of exceedingly valuable lands.

The water of the Courtableau could be utilized by the citizens living along Bayou Teche for a constant supply of pure, fresh water, and for irrigation purposes, throughout its length; whereas, as the matter now stands, the alluvial parts of your Parish are unprotected from overflow, the Courtableau is not navigable, and the Teche is not now sufficiently supplied with fresh water.

We would, therefore, suggest that you take some steps to have the Parishes of Iberia, St. Martin and St. Mary pay the expenses of dredging Bayou Teche from its head to a point where the bottom would be sufficiently low to carry off the surplus waters of the Courtableau.

We would recommend that your Board expend whatever funds may be available in the construction of a levee line on the Atchafalaya River.

Very truly yours,

For the Board of State Engineers,

M. P. ROBERTSON,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, May 5th, 1902.

To His Excellency, W. W. Heard, Governor of Louisiana, Baton Rouge.

SIR: In accordance with your request, I have the honor to state that the necessary surveys for the improvement of the State House grounds at Baton Rouge have been made under the direction of this Board, and a plan is submitted, herewith, for your consideration.

In order to study the different maps submitted to you, I would respectfully suggest that you examine each detail of the different plates. We have tried to conform these plans as nearly as possible to the present existing condition of the grounds, with a due regard for their drainage, the trees that are now growing, and the general principle of terracing which now exists, so as not to destroy the terracing effect, Baton Rouge being the first hills jutting out on the river.

The three principles which we have made paramount have been: first, the preservation of the terraces; second, the conformation of the ground to the established city grades of Baton Rouge; and third, the planting of palms and flowers in the low ground on either side of the State House.

To have changed the plan of improvement of the pleateau upon which the State House is now situated, would have necessitated the removal of many valuable trees and not given the proper recompense in flowers and palms; but we have included in this plan Schillinger sidewalks in place of those that now exist in gravel and brick.

Plate No. 1 shows topographically and by elevations the present condition of the grounds.

Plate No. 2. The proposed improvements.

Plate No. 3. By sections and profiles the proposed new grades for banquettes and grounds.

For convenience in studying the plan of improvement, we have divided each special feature of the work under its own heading, as follows:

Earthwork—Under the head of earthwork, we have attempted, without detracting from the appearance of the ground, to get as much material as possible for the filling in of the low ground between Natchez street and the terrace, and in order to do this it

has been necessary to extend the terrace which now exists on the America street, or south side of the State House to St. Philip street, and to lower the grade at the foot of the present existing terrace from its southwest corner to St. Philip street, as will be shown fully on Plate No. 2. We have been able to gain about 2,000 cubic yards of material from this source, but will still have to haul about 850 cubic yards. In detail, we would say that a reasonable cost for the excavation where the material may be obtained from the grounds will be about 25 cents per cubic yard, or an aggregate of $500.00. The hauling of the 850 cubic yards to be obtained outside of the grounds will cost about $650.00.

Retaining Walls.—There will have to be constructed retaining walls from the natural surface of the ground to 6 inches above sidewalk grade for the fence, which will aggregate about 70,000 bricks at $14.00 per thousand laid, making a cost of say, $1,000; sidewalks, retaining walls at curbs, aggregating about 35,000 bricks, at $14.00 per thousand laid, making a cost of say, $500.00.

Schillinger—For Schillinger sidewalks on the banquetes, a 9-foot sidewalk on St. Philip, America and Natchez streets, aggregating about 534 square yards, at $1.50 per square yard, making a cost of say, $1,500; and a 12-foot banquette on North Boulevard street, 220 feet in length, aggregating 285 square yards, at $1.50 per square yard, making a cost of say, $500. For the walks in the State House grounds, as per Plate No. 2, 1,600 square yards, at $1.50 per square yard, making a cost of say, $2,400.

Drainage—For vitrified pipes for drainage of terraces and grounds, 2,000 linear feet, at 25 cents per foot, costing $500.00. For 10 gratings or catch basins, at $5.00 each, costing $200.00.

Fences—For removing, replacing and recasting 1,121 feet of fence, $2,000. There seems to be considerable doubt as to whether it is feasible to remove and replace the fence now standing on the grounds on North Boulevard and America street to any additional grade or lesser grade, without recasting the pickets. There is in your possession, or has been made by Major R. L. Pruyn, a plan showing a remodeling of the fence with the lower stringer alone remaining as it is now, and the balance of the fence removed. This plan, on his estimate, would cost about $1.40 per foot. Several experts have been called upon by this Board to make an examination as to this question, and have reported that there would be a space of at least one-fourth of an inch showing above the rail at the bottom of the pickets, which would be evidently unsightly. It

might be possible, however, that this defect would not show above the line of the railing, as there is considerable play in the post, and the grade for the most part seems to have been set in the railing rather than in the pickets.

Painting—For painting of fence, $500.

Gardening—Including furnishing of the necessary palms and flowers, as per plan, $700.00.

For superintendence and contingencies, $1,000.

RECAPITULATION.

Earthwork—		
Cubic yards of cut, fill and hauling		$ 1,150.00
Retaining Walls—		
At fence	$1,000	
At curb	500	1,500.00
Schillinger—		
9-foot sidewalks	1,500	
12-foot sidewalks	500	
Walks	2,400	4,400.00
Drainage—		
Vitrified pipes, catch basins		700.00
Fences—		
Removing, replacing and recasting of	2,000	
Painting of	500	2,500.00
Gardening—		
Furnishing, planting and modeling of garden		700.00
Superintendence and contingencies		1,000.00
Total		$11,950.00

Very respectfully,
The Board of State Engineers,
Per M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 13th, 1903.

Governor W. W. Heard, Baton Rouge, La.

DEAR SIR: As understood over the telephone last Sunday, I promptly went to Alexandria, returning here yesterday, after an extended conference with Hon. J. G. White, President of the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District, in regard to the district dam across the head of Bayou Lamourie, in Rapides Parish, the siphon over the dam, and the recent destruction of the same.

This dam was constructed by the district as part of the plan for improving drainage from Alexandria to Bayou des Glaizes,

recommended by the Board of State Engineers. It was completed in April, 1901, at a cost of $1,347.84.

Serious opposition to the closure of the Bayou had been made by a number of the residents on Bayou Lamourie, claiming that it would cut off their necessary supply of water for family use, watering stock, etc. To satisfy this, the district, at a further expense of about $1,000, placed an 18-inch siphon, fully equipped for service, over the dam.

This arrangement appeared at the time perfectly satisfactory to all parties concerned, the residents of Bayou Bœuf, particularly those below the head of Bayou Lamourie, having always greatly favored the project, and the anxieties of those on Bayou Lamourie having been allayed by the successful operation of the siphon.

The Board of State Engineers was satisfied that the closure of Bayou Lamourie would prove a most valuable and comparatively inexpensive adjunct to the project for improving drainage proposed, which has since been fully demonstrated, and did not believe that any unfavorable conditions would under normal conditions result in Bayou Bœuf.

For a period of nearly two years the situation in all directions has been eminently satisfactory, but, as the result of a phenomenally wet period of about four months duration, a congested state of affairs occurred this spring in Bayou Bœuf, more particularly above than below the dam, and considerable territory which it is claimed had enjoyed immunity from serious overflow from rain water for a great number of years suffered in consequence.

The conclusion was immediately arrived at by those who were thus affected that the prime cause of this overflow was due to the closure of Bayou Lamourie, and the Levee Board was appealed to for relief.

The Board of Commissioners promptly agreed to have the necessary investigations made to determine the facts in the premises as soon as local conditions would permit.

Opportunity to make this investigation has not yet been given.

In the meantime, as the water in Bayou Bœuf declined very slowly and the overflowed area was apparently receiving little or no relief, the demolition of the dam at Bayou Lamourie at the hands of those who had grown impatient over the situation resulted, and on Monday last Bayou Lamourie was running bank full.

The Board of State Engineers does not believe that the closure of Bayou Lamourie was altogether responsible for this overflow,

but that under similar conditions, practically as serious and general an overflow from rain water is likely to occur on Bayou Bœuf at any time, whether Bayou Lamourie be opened or closed, until such time as Bayou Bœuf itself may be properly cleared and improved to its former carrying capacity, which has gradually become impaired by the diversion of its waters through Bayou Lamourie in the past, and its choking up with silt, from numerous drains into it, timber growth, dams, low water bridges, fords, the encroachment upon its banks for habitation, and for stock and hog pens, etc.

The opening up of Bayou Lamourie at this time, after quite an extended dry period, with little or no supply to Bayou Bœuf from recent rainfall, will demonstrate little or nothing in regard to what the situation might be under extreme weather conditions as existed in December, January, February and March last.

The investigation asked for will still be made by this Department, as soon as the opportunity will permit, and, as I understand it, the Levee Board will be governed by the report of the Board of State Engineers, as to its further action in regard to the restoration of the dam and siphon.

I shall be pleased, if you desire it, to keep you further advised of the situation as it develops.

I return to Alexandria to-night.

Your very truly,

FRANK M. KERR,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 2nd, 1902.

To His Excellency, W. W. Heard, Governor of Louisiana, Baton Rouge, La.

SIR: I respectfully report for your Excellency's information that in accordance with directions, I attended upon the Mississippi River Commission at its recent meeting in St. Louis.

The session began June 23rd, and continued four days. The first day's session was public; and the Commission listened to the remarks and statements from twenty or more persons representing various river interests—among them Congressman Ransdell, President Barham, of the Tensas Basin Levee Board, and President McClellan, of the Fifth Louisiana Levee Board.

The "Rivers and Harbors Act" (Public Act of Congress No. 154, approved June 13, 1902) appropriates $2,200,000 for improving the Mississippi River from the head of the Passes to the mouth of the Ohio, and authorizes additional contracts for $6,000,000, at the rate of $2,000,000 per annum, for three years ending June 30, 1906. Out of amounts thus appropriated and authorized, expenditures during the two years, are authorized for New Orleans, Natchez and Vidalia and Memphis harbors, and for rectification of Red and Atchafalaya Rivers, aggregating $200,000. Also from the amounts appropriated and authorized expenditures during the four years are authorized as follows: for Greenville, Miss., $50,000; Helena, Ark., $20,000; Caruthersville, Mo., $20,000; and New Madrid, Mo., $20,000; aggregating $110,000.

The total appropriation and authorized expenditure for four years ending June 30, 1906, being $8,200,000, out of which specific appropriations are made aggregating $310,000, leaves for distribution or allotment to the several clases of work $7,890,000.

For two years the amount appropriated and authorized is $4,200,000, out of which $200,000 is specifically appropriated, and (presumably) one-half of the $110,000 appropriated and authorized for four years, so that the amount available for two years is $3,945,000.

Out of this amount the Mississippi River Commission allotted for levees $1,000,000 per annum for two years—that is, $2,000,000, or, say, 57 per cent of the total amount available.

The distribution of this allotment among the several levee districts was as follows:

Name of Levee District.	1902-3.	1903-4.	2 years.	
Upper St. Francis, Mo.	$	$ 20,000	$ 20,000	
Reelfoot, Ky. and Tenn.	20,000	20,000	40,000	
Lower St. Francis, Ark.	125,000	125,000	250,000	
White River, Ark.	90,000	90,000	180,000	
Upper Yazoo, Miss.	70,000	70,000	140,000	
Lower Yazoo, Miss.	291,000	291,000	582,000	
Upper Tensas, Ark. and La.	112,500	112,500	225,000	
Lower Tensas, La.	110,000	110,000	220,000	
Atchafalaya, La.	40,000	40,000	80,000	
Lafourche, La.	20,000	20,000	40,000	$788,000
Barataria, La.	10,000	10,000	20,000	
Pontchartrain, La.	101,500	81,500	183,000	
Lake Borgne, La.	10,000	10,000	20,000	
	$1,000,000	$1,000,000	$2,000,000	

The allotment for levees in which Louisiana is directly interested amount to $788,000, that is, about 39.4 per cent of the total allotment for levees.

The Commission also allotted $245,000 for bank revetment and harbor work in which Louisiana is interested, as follows: at Bondurant, La., $100,000; at Kempe, La., $80,000; for Natchez and Vidalia Harbors, Miss., and La., $60,000; for rectification of Red and Atchafalaya Rivers, La., $15,000, and for New Orleans Harbor, $95,000.

The State of Louisiana, I think, has good reason to be pleased with the action of the Mississippi River Commission in its allotment of the funds for river improvement placed at its disposal.

Very respectfully,

HENRY B. RICHARDSON,

Chief State Engineer.

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., May 19th, 1903.

To the Mississippi River Commission, through General O. H. Ernst, Corps of Engineers, U. S. Army, President.

GENTLEMEN: In compliance with the request contained in your resolution, transmitted in a letter from the President of the Commission, of date April 6th, 1903, I have the honor to submit the following statement relative to the "High Water of 1903, and condition and needs of the Levees" on the Mississippi River, protecting the alluvial lands of the State of Louisiana:

INTRODUCTORY STATEMENT.

The levee system directly protecting the State of Louisiana against overflow from the Mississippi River extends on the right bank from "Costello's Gin," on Amos Bayou, Desha County, Ark., to Bougere Landing, about 26 miles above the mouth of Old River—usually known as the mouth of Red River—a distance by river of say, 333 miles; and from Barbre's Landing on Old River, at the head of the Atchafalaya, to the Jump, 10 miles above the head of the Passes, a distance by river of about 302 miles.

At Donaldsonville, 182 miles below the so-called mouth of Red River, this line is interrupted by the outlet of Bayou Lafourche, which is levee on both sides for some 80 miles below. On the left bank the levee system extends from Baton Rouge to Bayou Goubray, below Fort St. Philip, a distance by river of about 207 miles.

Between 1886 and 1902, the State Legislature has created fifteen Levee Districts, each having a Board of Commissioners invested with corporate powers to provide and administer revenues for the construction and maintenance of levees. The line above referred to comprises the levees along the Mississippi River in eight of these districts, viz: On the right bank—in the Fifth Louisiana Levee District, from the Arkansas line to near the mouth of Red River, about 218 miles; in the Atchafalaya Basin Levee District, from Barbres Landing on Old River to the head of Bayou Lafourche, at Donaldsonville, about 128 miles; in the Lafourche Basin Levee District—except the City of New Orleans—from the head of Bayou Lafourche to Riceland, about 120 miles; and in the Buras Levee District, from Riceland to the Jump, about 34 miles. The Tensas Basin Levee District, lying in the interior between Bayou Macon and the Ouachita River, aids in the construction and maintenance of levees on the right bank of the Mississippi River in Desha and Chicot Counties, Arkansas. On the left bank: the Pontchartrain Levee District has a levee line extending from Baton Rouge to New Orleans, about 126 miles; the Lake Borgne Levee District, a line from New Orleans to Bohemia, about 48 miles; and the Grand Prairie Levee District, a line from Bohemia to Fort St. Philip, about 26 miles; while the Orleans Levee District has levees on both banks of the Mississippi coterminus with the limits of the City of New Orleans, about 13 miles on each side.

The levee systems of these districts, with the 85 miles of levee in Arkansas upon which Louisiana is directly dependent, have an aggregate length on the Mississippi River of about 811 miles; while the levees on interior streams—the lower Red, the Atchafalaya, the des Glaizes and the Lafourche—which are more or less brought into service by flood stages of the Mississippi, sum up a length of over 260 miles; thus making the total length of levee line directly protecting Louisiana against overflow from the Mississippi River and subjected to strain by the high water of 1903, exceed 1,070 miles.

The High Water of 1903.

The high water of 1903, as affecting the levees of Louisiana, may be said to have begun in December, 1902, although the stages reached at that time in the Mississippi River did no harm except

to interrupt some of the work of levee enlargement then in progress. On Red River, in the northern part of the State, the water was at some points higher than ever before recorded. One crevasse occurred about 50 miles above Shreveport, while the enormous erosion of the river banks—in some places on both sides at the same time—made a vast amount of work necessary on hastily built loops around the places breached or threatened by the rapid caving.

But the December floods had generally declined by the end of January, and it was not until the heavy rains which occurred throughout the valleys of the tributaries in the first two weeks of February, that the probability of a dangerously high water in the Mississippi became apparent. After about the fifth of February, the rivers in Louisiana rose continuously, and, a part of the time, rapidly, so that within the next two weeks the water was generally well against the levees in all parts of the State. On the lower Mississippi, at Fort Jackson, the gauge read the same as the highest in 1897 (7.2 feet) as early as March 5th, and by March 21st, it reached 0.8 feet; that is, 0.8 of a foot higher than any stage previously recorded. Near the upper end of the State—at Lake Providence—the high water mark of 1897 (44.54 feet on the gauge) was passed this year on March 19th, and on March 27th, the gauge reading was 46.45 feet, or 1.9 feet higher than the highest of previous record.

At Vicksburg, 57 miles below Lake Providence, the highest stage this year was 0.7 foot below the highest of 1897; while from St. Joseph to Natchez the water was from 0.2 to 0.6 of a foot higher than in 1897. From Red River Landing to College Point the highest stage of 1903 was from 0.2 to 0.6 lower than the highest of 1897; but at New Orleans and at Fort Jackson it was about 0.8 of a foot higher than in 1897, and at intermediate points higher still.

The lower part of the river reached proportionately high stages this year sooner than similar stages were reached above. For instance, at Fort Jackson a half stage appeared four days earlier than at Baton Rouge, 206 miles above; a three-quarter stage, nine days earlier, and the highest, seventeen days earlier. The flood of 1897, also exhibited the same sort of prematurity in its stages below, though in the floods of 1898, 1899 and 1900 such marked advance of dates was not apparent.

The floods of 1897 and 1903 were both preceded by three or four years of only moderate high water.

These facts may further corroborate the conclusions relative to the increased carrying capacity of the river between Carrollton and Red River Landing, stated in the paper by Major Derby, published as Appendix I of your Annual Report of 1900. They may also indicate that the maintenance of such increased capacity is, as might be expected, dependent upon the passage of the larger floods, and that even the largest floods require time for the accomplishment of their work.

The effect of crevasses in limiting flood heights in Louisiana this year appears to have been insignificant. The crest of the flood wave coming down the river must have nearly reached the upper line of the State when the breaks in levees on the opposite side below Greenville occurred. A further rise of three or four-tenths of a foot, or say 47 feet on the gauge, was the most that could have been expected at Lake Providence. The largest crevasse of the season, at Hollybrook, five miles below, occurred when the river had already fallen over two feet at Lake Providence and a foot and a quarter at Vicksburg. It, of course, had no influence upon the maximum stage in that locality. While the return to the river of flood water from these crevasses at Vicksburg and the mouth of Red River, evidently prolonged the high stages at those points, it apparently failed to produce an increase of height at either place.

The only other important crevasse on the Mississippi River in Louisiana, at Hymelia, 36 miles above New Orleans, was so constantly worked upon in the efforts made for its closure that its discharge was never sufficient to appreciably affect the flood stage, which had practically culminated at the time the break occurrred.

The water in Bayou Lafourche, as usual, rose to excessive heights. At some points from 30 to 50 miles below its head, the stage was at least a foot higher than in 1897. Three breaks occurred in the levees on its right bank. In the Atchafalaya, at Melville, about 30 miles below its head, the stage was 2.6 feet higher than in 1897. This extreme high water in both these streams—and also, to a large extent, that in Bayou des Glaizes and the lower Red—was, of course, due to the high stage of the Mississippi.

Condition of the Levees.

The continued work on the levees of Louisiana during the past twenty years by the Levee Districts, the State and the United States has resulted in a constant improvement of their height, width and location, so that the flood of 1903 found them better in

grade, section and apparent strength than they ever were before. At the same time there remained in most of the districts many stretches of levee with little or no margin of height above the flood level of 1897, and with corresponding deficiency in width and mass. In the Pontchartrain Levee District alone it was estimated that as much as 21 miles, or one-sixth of its levee line stood less than one foot above the high water of 1897; while in other districts, although the proportion of low levees was nowhere as great, there was some 12 miles more, making an aggregate of say 33 miles.

When it became evident that the rivers in Louisiana might rise to a height equal to or above the high water mark of 1897, the Levee Commissioners of the several districts and your executive officers began the work of raising the crowns of the lowest levees. This was generally done with a small bank of earth revetted on the water side with one or two lines of inch plank, or, sometimes, with several tiers of earth-filled sacks.

The total length of this class of work on the Mississippi River in Louisiana was about 71 miles, some 24 miles of which proved actually necessary to prevent water running over the tops of the levees, and a much greater length to prevent waves washing through them where the margin above water was only a few inches.

In the upper part of the State, the Commissioners of the Fifth Louisiana Levee District found it necessary, on account of the unprecedentedly high stage of the river, to raise the levee south of the Arkansas line from one to two feet for a distance of 17 miles; and the rise of the river was so rapid that there was not time to obtain earth otherwise than by cutting away a part of the crown and taking a slice from the upper portion of the rear slope of the levee. The water stood against this emergency work, overtopping the crown of the original levee in some places as much as two feet. In the lower part of the State also—especially in the Buras and Grand Prairie Levee Districts—the water overtopped the levees for a length aggregating at least five miles, and, although the levees there were raised for a much greater length, it was found impossible in the Grand Prairie District to prevent this temporary work from being washed away in some places by the waves, which were mostly caused by the passing of large ocean steamers.

Inspectors, watchmen and guards were generally placed on the levees by the Commissioners in all the districts of the State; the Tensas Basin Levee District sending forty guards outside the State to Desha County, Ark.

You executive officers stationed boats loaded with tools, sacks, lumber, etc., at convenient intervals along the river, and some of the levee districts kept trains of cars similarly laden, all of which were constantly in readiness to move promptly to any point where they were needed.

The expenses incurred in this class of work by the several levee districts of the State—not including the cost of closing and attempting to close crevasses—amount to over $185,000.

Before the water came very high against the levees special attention had been generally given to the drainage of the roads and land adjacent to the levees; and wherever drains were open and made effective, the firmer, dryer and less leaky condition of the levees was in marked contrast with their condition in places where drainage was deficient. During the higher stages of the flood numerous holes (usually ascribed to crawfish) developed at and near the base of the levees, and many places on the slopes became soft and, sometimes, began to slough down their sides. It was noticeable that such holes and sloughs were usually at places where the drainage was least efficient or most recently made.

Holes discharging muddy water were generally treated by placing earth, or driving sheet piles, on the river side of the levee at or beyond the base, and usually with success. In some cases "run-arounds" of earth or walls of sack were used to surround the outlet of the holes on the land side. Sloughing places were mostly treated in a similar manner—that is, with earth placed on the river side slope, with good results—but when so extensive as to threaten encroachment upon the crown of the levee, they were often covered with brush, cinders, or other porous material, and loaded down with earth in sacks, and sometimes backed up with a wooden bulkhead at the toe of the sliding mass. It is not certain, however, that the same amount of work and material applied, in such cases, to the river side of the levee would fail to prove equally as effective.

Several breaks occurred in the Grand Prairie Levee District (about 1018, 1025 and 1040 miles below Cairo) due to the water overtopping the small levees there, and despite the strenuous efforts made to build them higher as the water rose. Their aggregate width is three-quarters of a mile or more.

The caving of the bank carried away the levee at Magnolia (1012 miles below Cairo) on April 5th, when the water was near its highest stage and close to the top. The levee was about 8 feet high and the cave took in a part of the land side base for a length of

about 230 feet, so that the water at once ran over the remaining part of the levee some two feet deep, and later, five or six feet deep. By prompt action the planters in the immediate vicinity succeeded in securely closing the crevasse within the next four days, and before serious damage was caused by overflow. The cost of the work is reported as about $7,000. At several other points crevasses were barely prevented by similar prompt attention; notably at Waterloo (876 miles below Cairo) in the Pontchartrain Levee District, where a large hole under the levee suddenly developed on April 13th, which was only stopped by a wall of some 12,000 sacks of earth surrounding its outlet, and a crib-work and bulkhead afterwards built on the river side.

But the two most important crevasses in Louisiana were at Hymelia (928 miles below Cairo) in the Lafourche Basin Levee District, and at Hollybrook (546 miles below Cairo) in the Fifth Louisiana Levee District, both of which, on account of location, height of levee and stage of river, threatened serious inundation of the levee districts in which they occurred.

The Hymelia crevasse had its origin in a hole at the base of the levee discovered late at night on March 26th, when it was described as "about as big as a hogshead." Before anything could be done to stop it, the crown of the levee fell in, and the break was rapidly enlarged. The levee was built in 1891 and enlarged in 1896. It was located on a "batture" in front of the old levee line, the remains of which still stood some 2,400 feet in the rear. There was a considerable growth of willows on the foreshore which extended 1,000 feet or more in front. It was 11 feet high, and a crown 8 feet wide, with side slopes of 3 to 1, was well grassed, and had a plank revetment in front, and is said to have been well drained. The guards who were patrolling the levee are reported to have passed the site of the break but a few hours previous, finding everything apparently sound and safe—the water about 2½ feet below the top.

No defect was known or suspected in the construction, and none had appeared in adjacent parts of the line.

Although the water against the levee was deeper than that in which it has usually been found that successful work for closing crevasses can be done, it was shallower on the willow batture in front, and thus presented a more favorable opportunity for the attempt than otherwise. The remains of the old levee in the rear also, to some extent, reduced the probable head to be encountered.

The District Levee Board, the railroads and the planters, therefore, began work next morning with large forces and ample materials, and continued vigorous efforts to close the break for over a month. The cost of the work to all parties contributing is reported as at least $130,000.

The usual method was adopted—that is, parallel lines of scantling driven as deep as practicable at sufficiently close intervals to prevent sacks of earth from washing through (commonly known as "cribbing")—which appears to be the only method that has often proved successful. Sheet piling was also used later, but the bottom scoured too rapidly whenever the opening became narrower than the gap in the levee, to make complete closure feasible, although at one time the cribbing had entirely surrounded the break. The final width of the crevasse in the line of the levee was about 750 feet; its size and discharge having, probably, been decidedly limited by the constant work done in the endeavor to close it.

The Hollybrook crevasse also had its beginning in a small hole that appeared on the side of the levee four or five feet below the top. It was first seen early in the morning of April 3d, by a colored laborer living close by, who failed to attempt stopping it, but instead, ran in panic to save his property and alarm his neighbors. The circumstances as regards previous inspection, the inability of those who first reached the place to close the hole, the size it then had, with the falling in of the crown and the rapid enlargement, were almost an exact repetition of those at Hymelia. The original holes at both places appear most likely to have been made by some burrowing animals, and the only difference, except as to size at the time of discovery, was in position. The levee where the crevasse started was about 17 feet high, with side slopes of 3 to 1, crown 8 feet wide, and a "banquette" 20 feet wide at 10 feet below the top. It was built in 1877 and enlarged in 1894 and again in 1899. It was well sodded and appeared in excellent condition, the water at the time of the break was 4 feet below the top, having fallen about 2 feet since the highest stage, five days previous. There was a wooded foreshore nearly a half mile wide in front of the levee, and cultivated land in the rear. No attempt was made to close the crevasse, though a line of trees was cut down and secured around it with a view to reducing the flow. It enlarged rapidly for about ten days and finally became over 3,000 feet wide.

EXTENT OF OVERFLOW.

Exact information as to the area and limits of overflow is not readily obtainable. It is probable that there are many ridges within the general boundaries of the flooded regions which remained above water, and on the other hand, possible that some small areas of overflow lie outside them. But the following statement, based on special reconnaissance and inquiry, and in part upon reports from Parish Assessors, are believed to be approximately correct.

The area overflowed by the small crevasses in the Grand Prairie District is mostly sea marsh and does not exceed 16 square miles, about 1,600 acres (2½ square miles) of which is adapted to rice culture, thought but little, if any, of the land had been prepared for sowing. The greatest damage resulting from this overflow was to the oyster beds, which had been extensively planted and were becoming the object of a profitable and increasing industry.

The two larger crevasses in Louisiana, at Hymelia and Hollybrook caused much less overflow and injury than would generally have been predicted from comparison with some of the larger breaks in levees near the same localities in previous years—for instance, with the Davis crevasse of 1884, 12 miles below Hymelia, and the Wyly crevasse of 1893, three miles above Hollybrook.

The water from Hymelia crevasse mostly ran back towards Lake des Allemands, spreading out only about two miles wide on the immediate river front, and overflowing say 11,000 acres of the cultivated plantations between the lake and the river. The water crossed the track of the Texas & Pacific Railway, and partially interrupted its operation for about ten days.

Lake des Allemands was raised about three feet above its usual level and Lakes Ouacha and Cataouatche somewhat less. The total area within the limits of overflow was about 1,320 square miles, at least 1,300 square miles of which was sea marsh, low swamp land, and normal water surface. The area of cultivated land laid under water by the Hymelia crevasse was not over 12,500 acres, say 19.2 square miles.

The overflow from Hollybrook crevasse covered over two-thirds of the area of the two upper parishes of the Fifth Louisiana Levee District; that is, East Carroll and Madison. In the latter parish the overflow was confined to the western part, leaving the cultivated lands on the river front untouched. The course of the water was towards the Tensas River and Bayou Macon, and thence down those

streams and through the low wooded lands adjacent, and across them into Franklin and Catahoula Parishes, passing between the high lands of Sicily Island on the west and the banks of the Tensas River on the east, and mingling in Black River some miles below the junction of the Ouachita and the Tensas, with the back water from Red River and Bougere.

The total area of overflow directly due to the Hollybrook crevasse is estimated at 930 square miles, about 46,200 acres (say 72 square miles) of which is cultivable land, in the Fifth Louisiana Levee District.

The aggregate area of overflow due to crevasse in the levees of the Mississippi River in Louisiana is thus estimated at about 2,266 square miles, of which nearly 93 square miles, or say, 59,300 acres, is cultivable land.

The total area of cultivated land in the seventeen parishes entirely included in the levee districts (except the Orleans District) bordering the Mississippi River was in 1901, according to the report of the State Auditor, 770,114 acres. The cultivated acrea has certainly been increased since that date; but leaving this out of the account, and also, because it cannot be dfinitely stated, leaving out the area included in the four parishes, parts of which only are contained in these levee districts—which area, by the way, was not overflowed in 1903—there was less than 8 per cent. of the cultivable land in these parishes overflowed by crevasses. If the actual figures were available the area overflowed would probably prove to be less than 7 per cent. That is to say, that at least 92 per cent., and probably a considerably larger proportion of the cultivable lands in the levee district bordering the Mississippi River was protected against overflow from vrevasses by the levee system—every acre of which must have been inundated had there been no levees.

The greatest overflow in Louisiana, however, was in the lower end of the Tensas Basin, and came principally from "back water" around the lower end of the levee system, near Bourgere Landing, and fro mthe high water in the Red, Black and Ouachita Rivers.

For the past thirty-five years, or more, there had been no attempt until last year to restore the line of public levees, which, at an earlier date, had been built and maintained below Bougere Landing (26 miles above the mouth of Red River), so that whenever the Mississippi rose above bank-full stage below Bougere, more or less overflow took place, adding to the water that backed up to its natural level through the mouth of the Red River.

But in 1902 a branch of the Texas & Pacific Railway was under construction along the right bank of the Mississippi, and its embankment was built to a higher grade than that of other parts of its line—that is, to near the level of high water in 1897—along the lowest stretch of the river bank, for several miles immediately below Bougere; and the Commissioners of the Fifth Louisiana Levee District extended their levee line some two and a half miles to a junction with the railroad embankment. It was hoped and expected that within another year or two the railroad bank would be enlarged so as to make it high and strong enough to serve as a levee, and that the levee line south of the high grade railroad bank could be extended so as to bring the terminus of the levee system down to within a few miles of the mouth of Red River. It was also thought possible that, meanwhile, the floods might not be greater than could be held by the railroad embankment.

But, as it proved, the flood of this year came high enough to breach the railroad bank by March 14th, at which date the back water from the Red and the Ouachita Rivers was still about seven feet lower there than in the Mississippi. The breach in the railroad bank rapidly widened and extended into the levee just built above, carrying away nearly two miles of it, and leaving the situation practically the same as it had been for many years previous.

The resulting overflow covered over 80 per cent. of Concordia Parish and a large area in Catahoula and Avoyelles Parishes before any water from the Hollybrook crevasse appeared there. In fact, the water from Hollybrook did not touch the upper part of Concordia Parish at all, and before it appeared in Catahoula the back water was already declining. The total area in these parishes overflowed by this back water from below Bougere was about 1,325 square miles, about 30,000 acres of which, in Concordia Parish, was cultivable land.

It is to be noted that had there been levees down to near the mouth of Red River, the back water would have been six or seven feet lower north of Bougere, and probably no cultivated land would have been flooded in Concordia or Catahoula.

NEEDS OF THE LEVEES.

The greatest need of the levees protecting Louisiana—as of most of the other levee systems—is enlargement. You already have estimates of what is needed for this purpose.

Notwithstanding the unprecedented height reached by the river this year at both the upper and lower ends of the State, there is nothing as yet apparent to indicate that the provisional grades for levees adopted by you in 1898 (shown in Plate B of your report of 1899) will prove insufficient. Had the levees been completed to "Commission Grade" they would have shown a margin above the water of 1903 of two to five feet everywhere from the Forts to the mouth of Red River, and thence to the head of the system in Arkansas, of not less than three and one-half feet.

The form and proportions of the "standard section" recommended by your district officers November 11th, 1899, still appears well devised and adequate for actual needs. Should means ever become available to make the levees wider in base and crown than this standard, it should, of course, give them an increased factor of safety, and such additional strength will doubtlessly be demanded at some future time when the sufficiency of their height has been proved by long experience.

The levees protecting Louisiana also need extension. To prevent overflow around the head of the system on Amos Bayou, the line should either be carried further up the bayou, or else the Arkansas River levees should be extended further down. The extension of the levee at the foot of the Lower Tensas District, is also necessary to limit the wide spread flooding caused by water backing around the present lower end of the system near Bougere Landing. The levee line should also be extended across the head of Bayou Lafourche so as to do away with the necessity of levees on its banks. An extension is also needed on the left bank below Fort St. Philip, at least as far as Baptiste Collet Canal.

The more immediate needs are for certain large levees necessary for their continuity, which are needed on account of caving banks and crevasses, and for the raising and enlargement of the lower part of the existing line, especially where the late flood heights were in excess of previous records.

That part of the Upper Tensas District in Louisiana furnished the most notable example of both these immediate needs. A levee to close the Hollybrook crevasse will probably require 400,000 cubic yards of earthwork, and two other new levees each requiring nearly as much will almost certainly be required before another high water season, on account of caving banks; one at Mascot (576 miles below Cairo), and another at Biggs (604 miles below Cairo); while the enlargement of the levees south of the

Arkansas line shown to be necessary by the extreme high water this year is estimated to require 900,000 cubic yards of earthwork.

The levees of the Mississippi River are still incomplete in all the State and districts. They have thus far served more efficiently than could have been expected in protecting the Alluvial valley from overflow, and they give increasing promise of entire success when they are all built up to the standards of grade and section designed for them. But much remains to be done before these standards can be reached; and, meanwhile, every district has its annual battle behind imperfect defenses to hold back the floods poured down from over a million square miles of watershed.

In some States—and notably in Louisiana—it is physically impossible to build any levees within their own territory which can protect them against overflow by water escaping from the river in neighboring States.

And so, a need for the levees more important for their complete success than any other, is that the United States take charge of their construction and maintenance. This is contemplated in Article 240 of the Constitution of Louisiana and earnestly desired by her people.

Respectfully submitted.

HENRY B. RICHARDSON,
Chief State Engineer, Louisiana.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 16, 1903.

Mr. L. L. Griffith, United States Junior Engineer, Vicksburg, Miss.

DEAR SIR—In compliance with your request of May 8th, 1903, I take pleasure in furnishing you, herewith, a tabulated statement showing the levee work on Red River undertaken by the local levee districts and the State of Louisiana under contracts entered into during the (U. S.) fiscal year ending June 30th, 1903.

IN THE CADDO LEVEE DISTRICT.

By the District	878,778 cu. yds., costing	$135,269.87
By the State	203,865 cu. yds., costing	39,249.80
Total	1,082,643 cu. yds., costing	$174,519.80

IN THE BOSSIER LEVEE DISTRICT.

By the District	385,959 cu. yds., costing	$ 65,536.25
By the State	260,000 cu. yds., costing	40,170.00
Total	645,959 cu. yds., costing	$105,706.25

On an aggregate in the two districts undertaken by the districts and the State of 1,728,602 cubic yards, costing $280,225.92.

The Red River, Atchafalaya and Bayou Boeuf Levee District was not called upon, during this period, to undertake any levee work on Red River, but on other streams in the district as much as 290,000 cubic yards of earthwork in levees, costing about $60,000, and of work for improving drainage, amounting to about 1,300,000 cubic yards, costing about $175,000, is under way.

The Bossier Levee District, in addition to the levee work shown in the statement furnished as having been placed under contract during this period, is, at this time, advertising for proposals to build new levees at Rough and Ready, 166.5 miles below Fulton, and at Scopini, 207.5 miles below Fulton, amounting to about 205,000 cubic yards.

As you already know, Red River was visited, at a short interval, within the past season, by two high waters of considerable proportions, the first, culminating at Shreveport on December 16th, 1902, reading 34.1 on the gauge, reached stages along many stretches of its length, in the Caddo and Bossier Levee Districts, from one foot to two and a half feet above any waters of previous record.

The second flood, culminating at Shreveport on March 23d, 1903, at a stage there but one foot lower than the first, failed to develop stages at other points as high comparatively as those developed on the first flood.

Notwithstanding these high stages of water in Red River, its levee lines proved equal to the task devolving upon them, except at Thompson's, 130 miles below Fulton. Here a breach in the line occurred and remained open during both floods.

The closure of this breach, as shown by the tabulated statement, has been undertaken by the State, and the new levee there is approaching completion.

The grade of the levees on Red River was found materially deficient at but four places in Caddo, at the head of Simpson's Lake, U. S. Levee, due to excessive settlement; at Hurricane Bluff, built by riparian owners, and at Ashwood and Pascagoula, and in Bossier, at Dortch's and Mercer's, built by district.

Except for caving banks, both floods would have been carried down Red River without serious cause for apprehension to any one concerned.

Owing, however, to the rapid enlargement of the section of Red River, along the Caddo and Bossier Levee District fronts, resulting

from the more successful confinement of its flood waters to the main stream by means of levees, than in its past history, the natural tortuousness of the stream, opposing numerous concave bends to the energy of the current, and the serious disturbance of its regimen by the number of cut-offs which occurred during high water, caving banks are more general and serious in these districts than will be readily understood without an intimate acquaintance with the facts.

Hence it follows that 95 per cent. of the work undertaken on Red River during this fiscal years has been placed in new lines of levee rendered necessary by caving banks, and, in addition to this, it appears evident that levee work at the following named points will in the near future, from the same cause, be required:

IN CADDO LEVEE DISTRICT.

Name of Levee.	Miles below Fulton.	Cu. Yds.
Elmer Slough to Coushatta Place	140.5 -141.5	125,000
Cedar Bluff	150.75-	55,000
Sterling Bayou	156.75-	25,000
Dixie	195.5 -196.0	136,000
River Dale	201.5 -202.0	85,000
Long Point	210.0 -210.5	50,000
Mussers	212.25-	15,000
Magnolia	222.5 -223.0	60,000
Lower Cross Keys	237.5 -238.0	25,000
		575,000

IN BOSSIER LEVEE DISTRICT.

Name of Levee.	Miles below Fulton.	Cu Yds.
Rough and Ready	166.25-166.75	100,000
Benoit's Bayou	176.75-	115,000
Pat Cash's	184. -	65,000
Pruitts	200.25-	50,000
Scopini	207.75-	105,000
Mercer's	211.5 -212.5	95,000
Magenta	214.25-214.75	50,000
		580,000

It is also apparent that, as a greater safeguard against future high waters in Red River, the following enlargement should be undertaken in the Caddo Levee District, viz:

Name of Levee.	Miles below Fulton.	Cu. Yds.
Blanton Bluff to Scott Slough	117.5 -139.5	150,000
Rush Bayou (Old River)	212.5 -213.0	25,000
Pascagoula (On Old River)	215.5 -216.5	25,000
		200,000

In the Caddo Levee District, that part of the system above Shreveport terminates, at this time, at Buckhall Plantation. This should be extended as far down at least as Cuba Place, and will require some 600,000 cubic yards of earthwork.

In the Bossier Levee District the line of public levee terminates, at this time, at Bear Point, but should, as soon as the means become available, be extended to the lower boundary of the district, at Swift Chute Bayou. This will require provision for about 150,000 cubic yards of earthwork.

To undertake the work of this fiscal year, both the Caddo and the Bossier Levee Districts have exhausted all their immediate resources and contracted against the revenues of the districts collectable on the tax rolls of future years, up to and including the year 1905.

It is, therefore, evident that any assistance the General Government can possibly accord the districts on Red River, in their struggle for protection against overflow, is greatly needed.

At times, between 1892 and 1900 the General Government fortunately came to the assistance of the levee districts on Red River to some extent, and levees aggregating about 960,000 cubic yards, costing about $143,000, were constructed at certain points in these districts. Beyond this no levee work has been done by the Government on Red River.

On the other hand, from 1892 to date the levee work on Red River undertaken by the local levee districts and State, has amounted to nearly 8,500,000 cubic yards, costing about $1,355,000, not including discount, interest or other incidental expenses of administration.

The particular levees in regard to which I spoke to you some time ago in Shreveport, were the Cavitt Levee, part of the Red Bayou Levee built in 1895-96 by the General Government, and the Dortch Levee, part of the Scopini Levee, built by the General Government in 1894-95. Later, conditions became so grave at both of these places that the districts could no longer defer action in regard to them, and new levees are already under construction at both, payable from funds collectible on future years.

If, in lieu of these two levees, covering breaches in levees built by the General Government, amounting in the aggregate to 385,000 cubic yards, the latter could possibly undertake some of the other work required in the near future in the districts, it would be greatly appreciated by the levee districts, and give them renewed courage in their efforts to maintain their lines of defense against the high waters of Red River. Respectfully,

(*Signed*) FRANK M. KERR,
Assistant State Engineer.

"STATE OF LOUISIANA,
"OFFICE BOARD OF STATE ENGINEERS,
"NEW ORLEANS, LA., Oct. 10, 1902.

"To the Honorable Boards of Levee Commissioners for the Atchafalaya Basin Levee District and the Lafourche Basin Levee District:

"GENTLEMEN—The resolutions passed at your joint session held in Donaldsonville on July 21, 1902, request the Board of State Engineers to report the proper location, with plans and specifications and estimates of cost, of a temporary dam at the head of Bayou Lafourche, to be built in accordance with the provisions of the several acts of the Legislature of the State of Louisiana and of the Congress of the United States.

"In compliance with this request examinations and surveys have been undertaken, and are now sufficiently advanced to allow us to submit the following preliminary report through your executive committee for your consideration.

"Act No. 9, passed by the State Legislature in 1900, authorizes you to place locks at the head of the bayou, the work to be subject to the supervision of the 'Federal authorities' and in accordance with 'plans and specifications to be furnished or approved by the Secretary of War.' The act provides that it shall go into effect as soon as the Federal authorities have given their consent. This act, however, gives no specific authority for closing the bayou—temporarily or otherwise—in any other manner than by locks at its head.

"The act of Congress, known as the rivers and harbors act (Public No. 154), approved June 13, 1902, presumably gives the consent requisite for putting in force the above-named act of the Legislature, in pursuance of which your organization is effected, as it authorizes you to construct a 'lock and dam' at the head of the bayou, subject to the supervision of the United States engineers, on plans to be furnished by you and approved by the Secretary of War.

"This act of Congress also authorizes the Secretary of War, 'pending the construction of said lock and dam,' to grant you permission 'to place a temporary dam across the bayou,' near its junction with the Mississippi River, and to maintain it for a period not exceeding two years and six months from the date of the act—that is, until December 13, 1904—provided, that the State of Louisiana legally authorizes you to construct the same, and that

you enter into agreement with the proper officer of the United States, with security, for its removal at or before the time prescribed.

"Finally the act of the State Legislature, No. 84 of 1902, authorizes you to place a temporary dam at the head of Bayou Lafourche pending the construction of locks, as provided for in Act No. 9 of 1900,' etc.; provided, 'the dam shall not be placed or begun before January 1, 1903.' The act also requires you, before beginning the construction of the dam, to enter into an agreement with the proper officers of the United States, etc., for its removal before the date prescribed in the act of Congress; and furthermore to 'maintain a depth of not less than six feet by not less than sixty feet in width of fresh water throughout the Bayou Lafourche' from the time of placing the temporary dam until the completion of a lock

"You are thus permitted, under the several acts mentioned, to organize for joint action and to take some preparatory steps toward the end you have so long had in view, of opening Bayou Lafourche to constant navigation while closing it against destructive floods.

"But the laws permitting you to act contain restrictions that must make the accomplishment of your purpose difficult, if not uncertain. For instance, you can not begin work on a 'temporary dam' before January 1, 1903. But during the eleven years from 1891 to 1901, inclusive, the water surface at Donaldsonville, on the first days of January, has read from 2.6 feet to 13.4 feet by the Government gauge, the average reading that day being 6.6 feet, at which stage the closure of the bayou would be attended by difficulties not usual in the construction of levee dikes, and during the month of January, in these eleven years, the stage of water has varied from 2.1 feet on January 17, 1895, to 22.5 feet on January 31, 1901. It is thus apparent that the successful completion, or even the beginning, of a dam after the first day of January and before the usual time of high water in any year, is, to some extent, uncertain.

"As the temporary dam must be removed by December 13, 1904, and as the locks can not be built at any reasonable cost except under the protection of the temporary dam, it might be reasonably doubted whether or not it would be worth while to build the dam at all if its beginning must be delayed until the low water season in the summer or autumn of 1903. If it is built in the summer of *1903, it can only* be of use—under the law as it now stands—during

the single high water season of 1904. It would have to be removed before the high water season of 1905—that is, before it is at all probable that a lock could be completed.

"If the temporary dam could be lawfully begun to-day, when the water is low and the upper rivers generally falling, there should be no reasonable doubt of its successful completion this season.

"Certain requirements of the second act of the State Legislature (No. 84 of 1902) add to the natural difficulties of the situation. The required maintenance of a channel of fresh water six feet deep and sixty feet wide throughout the bayou from the time of placing the temoparary dam until the completion of a lock, presents a problem not readily solved. If sufficient time were allowed after the dam is built to dredge the required channel or to build auxiliary dams and pump up the necessary six feet of water, the work might be easily done, but it can not now be assured that you will be able to supply the requisite depth of channel until some months after the placing of a dam.

"The requirements that there shall be fresh water throughout the bayou at all times must also involve considerable time and a large amount of work and expense, in whatever manner its execution might be attempted. It fortunately happens, however, that an ample supply of fresh water can be obtained from the natural drainage area on either side of the bayou by making canals to connect them with it; although the introduction of water from some of these sources, that might prove the best and most desirable appears to be prohibited by that part of the law which only permits 'lake connection below the lower line of the parish of Assumption.' Also a supply of fresh water can, of course, be readily had from the Mississippi river whenever it is high enough for the successful operation of siphons, though at extreme low water stages there has never been a flow of any consequence from the river into the bayou—the sandbars in its bed having at such times formed natural temporary dams.

"Considering the facts and circumstances as above stated, we are of the opinion that the best method of carrying out your purpose in compliance with the intent of the laws, will be (1) to build the temporary dam of earth, in the same manner as an ordinary dike or levee; (2) to dredge the bayou to the required depth and width wherever it is now deficient at extreme low water, and (3) to introduce fresh water by opening canals from Lake Beouf on the left bank, or *from Lakefield* on the right bank, or from both.

"We have made detailed surveys at the head of Bayou Lafourche and have prepared a map showing proposed location of a temporary dam, with suggested site for a lock.

"The proposed line of location crosses the bayou nearly at right angles from a point about 100 feet northeast of Iberville street in Donaldsonville, where the required embankment, including the connecting levee on the north side, would be about 400 feet in length. The dam proper, from bank to bank of the bayou, would be only about 230 feet long, with an extreme height of say 39 feet. This location would leave room to build a lock between the dam and the bridge at Nicholls avenue, with a chamber 250 feet or more in length.

"If the dam is built with a crown thirty feet wide and with side slopes of three horizontal to one vertical, as is shown on the map, there would be required about 35,000 cubic yards of embankment; about 30,000 cubic yards of which would be in the dam proper. If built with a crown ten feet wide and banquette twenty feet wide at ten feet below grade—which is a usual form of levee construction—the cubic contents would be reduced by about 3,000 cubic yards.

"If the stage of the river is below, say, ten feet by the Donaldsonville gauge on January 1, 1903, and so remains for a sufficient length of time, the earth necessary to build the dam and connecting levee can be obtained from the batture on the river side of the levee, within, say, 200 yards of the embankment. But should the river rise during the progress of the work, access to the earth on the batture would be rapidly cut off, and the available supply reduced by the increasing height of the water, and it would then be found necessary to obtain earth from pits on the land side of the levee.

"As it is possible that such land side borrow pits could only be had after prolonged expropriation proceedings or by purchase at exorbitant figures, it may be well to consider the propriety of attempting to move earth from low lying areas on the batture to a higher level while the river remains low, so as to have material accessible in case of a higher stage of water.

"In any event it would be a wise precaution to begin the building of the connecting levee at the earliest date practicable taking the earth required from the lowest level permitted by the stage of the river. The beginning of work upon the temporary dam must, *of course, under* the law, be delayed until January; but should

the river be rising at that time it would go far to insure the completion of the work to have earth in a position to be available above water, and to have the 5,000 cubic yards in the connecting levee already in place.

"We have surveyed cross sections of the bayou from levee to levee, at stations located about every half mile, between Donaldsonville and Lockport with a view to estimate the amount of dredging necessary to secure the channel prescribed by law. Results based upon measurements taken at such wide intervals are, of course, more or less inexact, but it is reasonable to assume that they afford a fair approximation to the actual requirements. Below Lockport, it appears probable from former surveys by the United States engineers and from recent reconnaissance, that the prescribed channel already exists and that no dredging will be needed.

"When a dam or lock is built at the head of the bayou and lake connections are opened, the water surface will generally remain near mean Gulf level, or probably a little higher in the rainy season or under the influence of prevailing southeast winds. A water prism 60 feet wide at mean Gulf level and 6 feet deep, as called for in the act of the Legislature, with side slopes of 3 to 1—which is probably as steep as they could be maintained—would require, according to the cross sections above mentioned, the dredging of about 650,000 cubic yards of material from the bottom of the bayou.

"There are few places, if any, where the dredged material can not be deposited within 10 or 20 feet of the edge of the 60-foot channel, though in some cases it may be necessary to place it at a greater distance to prevent sloughing.

"There is nothing in the law to prevent the beginning of this dredge work at any time you see fit to undertake it. Should it happen from any cause that you fail to build the dam before the flood season of 1903, there might be a considerable loss of depth or width in any channel previously dredged from material washed back into it by the high water current; but this is a risk which, under the circumstances, we presume you will not hesitate to take.

"After extended exploration and examination of the waters adjacent to Bayou Lafourche on both sides, we conclude that the best sources for supplying fresh water by lake connections below the lower line of the parish of Assumption' are Lake Boeuf and Lake Field.

"Lake Boeuf lies on the left bank of the bayou, and receives, or is directly connected with, the drainage from nearly the entire

basin above Raceland between Bayou Lafourche and the Mississippi river, or from an area of over 400 square miles; while Lake Field and Lake Long, with which it is connected—lie in a basin on the right bank of the bayou below Thibodaux, having an area of at least 150 square miles. We have made surveys for canal to connect these lakes with the bayou at points that appear most available for the purpose. The survey for Lake Boeuf connection joins the bayou about three and one-half miles above Raceland, and runs through Home Place plantation, belonging to Alexander Theriot, very near its upper boundary line. The length of surveyed line is 2.4 miles, about .4 of a mile of which is in the bed of Lake Boeuf. The line surveyed for connection with Lake Field is along the old Company Canal from Lockport, and is about 1.2 mile in length, about .2 mile being on the lake.

"Taking the bottom of the canals at a depth about 3¼ feet below mean Gulf level—that is, low enough always to have at least 3 feet of water in them—the deepest cut required on the Lake Boeuf Canal, except through the levee and the railroad embankment, would be 13 feet, and on the Lake Field Canal the deepest cut, except through the levee, would be about 12 feet.

"In both cases there are existing canals along the lines or along some part of them, which to some extent reduces the quantity of excavation now required. But those old canals are of little value for the present purpose from the fact that a large part of the material originally taken from them would have to be moved again in their enlargement.

"The work required to excavate these canals could probably be most economically done by floating dredges; though a large part of it might be done by other methods of dry land excavation.

"Estimating the earth to be moved in cutting these canals on the basis of a bottom width of 24 feet, at the elevation above stated, and side slopes 1½ horizontal and 1 vertical, there would be about 110,000 cubic yards in the Lake Boeuf canal and about 50,000 cubic yards in the Lake Field canal.

"Bridges across the canals would be necessary for the public roads along the bayou, and also across the Lake Boeuf Canal for the Southern Pacific Railway track, with possibly one or two others for the convenience of private owners.

"When the canals are opened their lake entrances should be guarded by booms to keep out floating aquatic plants, and constant care should be exercised to exclude and remove all such

growths from the canals and the bayous. The relative order in which the several parts of the work above outlined should be undertaken and prosecuted is perhaps a matter of no great importance, as it is plainly desirable to begin them all while the rivers remain low and to complete them at the earliest moment possible. There is no physical reason why any part of the work might not begin today, but the temporary dams, of course, can not be lawfully begun until the 1st of January next year.

"Work on the connecting levee and for placing earth in position to be used in the dam should begin as soon as you can undertake it. The dredging of the bayou and the cutting of the Lake Boeuf connecting canal should also be begun at the earliest possible date. The cutting of the Lake Field Canal might be delayed until a dredge, either from the Lake Boeuf Canal or from the bayou itself were ready to undertake it.

"Dredge work in Bayou Lafourche should begin at its head near the site of the dam, and thence proceed down stream, and at the same time work should be begun on the connecting canal from Lake Boeuf toward the bayou.

"Besides the making of contracts and agreements for the actual execution of the work, you will have a number of preliminary matters to arrange before it can be prudently commenced. The right of way for cutting the canals connecting with Lake Boeuf and Lake Field, as well as agreements giving you permanent control over them, should be secured; and under both the State and the United States laws, before you can begin the temporary dam you must obtain the permission of the Secretary of War, and enter into agreement with the proper United States officer, with security, for its removal.

"It would be well to have an understanding with the Southern Pacific Railway Company relative to the crossing of its track by the Lake Boeuf Canal, and the passage of a dredge, and also to secure an option upon land suitable for a barrow pit at the head of the bayou in case the stage of the water in January should require it.

"Both of your districts have contracts for levee work at prices scaled acording to the height of embankment called for. The maximum price stipulated in either contract is twenty-nine cents per cubic yard of earthwork in any 'station' (i. e., a length of 100 feet) of levee having an 'average gross height of twenty-four two twenty-five feet.' We, therefore, take a fraction over this figure, or thirty

cents as a fair price per cubic yard for estimating the probable cost of the earthwork required in the temporary dam and connecting levee; and, considering the long haul probably required for placing earth in position to be available in case of an early rise of the river, as well as the general risks and difficulties attending the completion of the dam, we put the same price upon the earth that is to be moved a second time.

"The dredging required in Bayou Lafourche, we believe, from careful comparison of its general character with that of dredge work now under contract in other places, should be done for a price not exceeding 12½ cents per cubic yard. It is possible that the excavation of the canals connecting the lakes with the bayou may cost a little more per yard than the dredgework in the bayou itself (principally for the reason that the quantity required is smaller), but we conclude it safe to estimate it at the same price.

"We have put no definite price upon the probable cost of right of way, of bridges or of land that may be required for barrow pits, but have added for these purposes and for other contingencies a sum that brings the total to a round figure of $125,000, made up as follows:

Temporary dam and constructing levee, 35,000 cubic yards, at 30 cents	$ 10,500
Earth for same to be moved a second time, say 10,000 cubic yards, at 30 cents	3,000
Dredging channel in Bayou Lafourche, 650,000 cubic yards, at 12½ cents	81,250
Cutting connecting canals from lakes, 160,000 cubic yards, at 12½ cents	20,000
Right of way, bridges, land for barrow pits and contingencies, say	10,250
Total	$125,000

"Should you decide to undertake the work as above outlined, we should be ready at your request to prepare detailed specifications as occasion may require.

"Respectfully submitted,
"*The Board of State Engineers,*
"*Per* HENRY B. RICHARDSON,
"*Chief State Engineer.*"

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., NOV. 12, 1903.

To the Executive Committee of the Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.

GENTLEMEN—I beg to report to you that I have lately inspected the work going on on Bayou Lafourche and Lake Boeuf Canal in connection with the Lafourche locking project.

I find that the dredge located in the vicinity of Donaldsonville has cut about one and one-half miles of channel up to date. This channel has pretty generally been cut out to the required dimensions. A certain amount of filling has taken place owing to the fact that the bayou is still open and the river water charged with sediment still enters Bayou Lafourche.

Dredge No. 2, which is cutting the bar just below the Howell crevass, has cut out about two miles of work up to date and is cutting the channel to the required dimensions, but in this case also a certain amount of filling has occurred, owing to the same cause as above, and owing to the fact that the material is deposited on a soft sand bar formation, which is mashed into the channel by the weight of the material deposited on it.

These two dredges, however, have done effective work, and upon the closure of the bayou the channel which they have cut will be found very nearly down to the required depth.

The third dredge at work, cutting from Lake Boeuf into Bayou Lafourche, has cut about 3,500 feet of canal up to date. This canal has been cut through the prairie. It has been cut much in excess of the dimensions called for, but owing to the soft nature of the prairie on which the material is deposited, the sides have a tendency to be mashed in, and the bottom has a tendency to fill with soft material. This, however, is inevitable in canals cut through prairie marsh.

As a whole, the work is progressing rapidly and satisfactorily.

I recommend that you order the beginning of the dam as soon as possible, as the present stage of the river at Donaldsonville is such that the work can be executed with a minimum of difficulty. It is rare that conditions as favorable as the present can be found at Donaldsonville, and for that reason I urge the beginning of the work at once, because any delay would probably find the water at a higher stage of the river, and, therefore, render the closure of the bayou very difficult, if not impossible.

I beg to urge you to meet as soon as possible the expenses incurred for inspectors' salaries, and expenses. The nature of the specifications which you have adopted for the work is such that it is necessary for the work to be inspected thoroughly and intelligently at all times,and the inspectors have now been working some sixty days without salary and without their expenses being paid. Under the circumstances, it is difficult to get proper work, and a failure of constant soundings and investigations on the part of the inspecting force will make it very difficult, if not impossible, to ascertain the amounts due under the contract.

The plans and specifications for the lock have been for several months in the hands of the United States Engineers and the Secretary of War, and I am informed are being very thoroughly inspected by them. An early report on these plans may be expected.

Very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Feby. 8th, 1904.

Hon. J. S. Brady, Chairman Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards.

DEAR SIR: In accordance with the instructions of the Executive Committee and a letter from the Presidents of the Atchafalaya Basin and Lafourche Levee Boards, I proceeded to Washington to endeavor to secure, through the efforts of Mr. R. F. Broussard, Member of Congress, an extension of the time for the removal of the temporary dam placed at the head of Bayou Lafourche.

Mr. Broussard, upon whom I called immediately upon my arrival in Washington, suggested that the matter be left to the decision of the Rivers and Harbors Committee, who had charge of all such matters. He arranged for a hearing to be given me on the subject by a sub-committee of the Rivers and Harbors Committee. Mr. Burton, Chairman of the Rivers and Harbors Committee, at Mr. Broussard's request, appointed such a sub-committee, composed of himself, Mr. Dovenor, of Ohio, and Mr. Randall, of Louisiana. I explained to these gentlemen the reasons which had occasioned the delay in undertaking the construction of the locks, and explained at length the position of the two levee boards in relation to this.

My remarks were frequently added to by Mr. Broussard, when he saw that a point might be made which would convince the sub-committee.

At first the sub-committee seemed inclined to extend the time for two years, and further authorize the Secretary of War to extend the time for two additional years, in case the work justified this extension; but after the committee had heard the matter at length, they decided to grant the original request, which was for a flat-footed extension of three years to begin from December 13, 1904. They will incorporate in a short Rivers and Harbors Bill, which they propose to pass at this session, the required extension of time, and Mr. Broussard has agreed to see that this item was duly incorporated in said Rivers and Harbors Bill.

I enclose you copy of the documents which were presented by me to said Rivers and Harbors Committee.

I cannot too strongly emphasize the valuable assistance which Mr. R. F. Broussard gave in this matter, and I consider it mainly due to his tact and resources that the matter went through so easily.

Very respectfully,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 2, 1904.

Major Henry B. Richardson, Chief State Engineer.

DEAR SIR: With regard to the letter of Capt. Charles S. Bromwell, dated February 29th, accompanied by enclosure, which you referred to me for answer, I beg to state the following, viz:

The Atchafalaya Basin and Lafourche Levee Boards are progressing with all of the energy with which they are capable in the work of the closure of Bayou Lafourche with a lock and dam. The dam has been constructed. Dredges have been working since last September to cut out a six-foot channel in Bayou Lafourche, imposed upon them by legislative enactment.

Two dredges are working in Bayou Lafourche, and have cut, up to date, some ten miles of channel. This is mostly six feet deep, although in some places it is somewhat scant in depth and will have to be gone over by the contractors. The two dredges engaged

in doing this work are about eight miles apart, working towards each other. When working satisfactorily, one dredge will cut about one and one-fourth miles per month. A third dredge is now engaged in cutting a canal from Lake Bœuf to Bayou Lafourche to furnish fresh water as contemplated by law, and in about two months this will be completed. It is then the intention of the levee boards, to have this third dredge join the other two dredges in their excavation in Bayou Lafourche.

The levee boards have authorized anyone wishing to do so to put freight transfers across the dike at Donaldsonville, so that freight might be transferred from the Mississippi River into Bayou Lafourche. The Levee Boards have also authorized parties owning private canals now abutting against the levees to cut said levees so that the private canal will open into Bayou Lafourche. As these canals connect with New Orleans by complete waterways and systems of locks, as soon as this is done there will be through navigation from New Orleans into Bayou Lafourche and up said stream. The canals authorized to be open are in the vicinity of Lockport.

Owing to the delay to which the Levee Boards have been subjected by legal proceedure instituted against them, preventing them from beginning the lock work, the levee boards have been compelled to call upon Congress to extend the time allowed them for the completion of the locks at Donaldsonville. This matter has been referred to the Rivers and Harbors Committee and has received its favorable consideration.

The above covers, I believe all the points mentioned in the letter accompanying that of Capt. Bromwell, and I have reason to believe that the levee boards are complying with the law and pushing the work ahead as fast as conditions will permit.

Very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

P. S.—In addition to the above, the levee boards have contracted for a battery of five 18-inch siphons, to be placed over the dike, so as to siphon Mississippi River water into Bayou Lafourche during the coming high water, and thereby supplement the effect of the fresh water canals being dug.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 31, 1904.

Hon. J. S. Brady, Chairman Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.

DEAR SIR: I have to report to your Honorable Committee that the inspectors' report for the dredging on Bayou Lafourche for the week ending March 26, show that the Sidney C. has cut about 965 feet during the week, that the Eclipse has cut about 1,900 feet during said week, making a total of 2,865 feet cut. The cut of the Sidney C. was a continuous cut down to the required depth, and pretty nearly of the required width. The cut of the Eclipse was not continuous, and there were 800 feet of the 1,900 feet cut that were sufficiently deep to allow the boat to pass without cutting. The cut of the Eclipse as shown by soundings behind the dipper was generally down to the required depth, but not to the required width. The inspector reports that some of this has filled up. The distance that the two dredges are apart now amounts to 312 stations or about 6 miles.

I have to report that this morning I visited the dike at Donaldsonville. I find that the cut for the siphons has been made through the dike. This cut is about 6 feet below the top of the dike, or about two feet deeper than the depth recommended in my letter of March 9th, 1904. One of the siphons seemed to be pretty nearly all connected up. Another one is in place, but not connected. I saw a number of pipes, in addition to this, on the side of the dike. The sheet piling, about 100 feet bayouwards of the bayou slope of the dike has been driven in.

I have to report that the land slope of the dike seems to be sloughing to a certain extent. The gauge this morning read 19¼ feet. There is every reason to believe that it will go 7 or 8 feet higher. As the river rises, sloughing will increase. It is apparent to my mind, from a thorough investigation of the situation, that a layer of quicksand underlies the foundation of the dike, that through this quicksand the water seeps, owing to the pressure on the river side, and in seeping through this layer carries with it a certain amount of sand, which bubbles up on the land side of the dike. The amount of sand thus carried through leaves cavities under the dike, which have to be refilled in some way, and this is done by

the land slope dropping into these cavities and thus breaking away from the dike.

I think this matter requires your attention, and some remedy, and I would suggest that your next meeting, on April 7th, be held at Donaldsonville, so that you might order such work at that point as may be necessary. I shall then be prepared to go into further details with you and suggest a plan of action. I also wish to state that this sloughing and the natural settling of the dike will bring the surface of the siphon cut lower down as the water rises, and, although at present, the surface of the cut stands two feet above '97 water, it may reach a considerable lower grade than that during extreme high water.

Respectfully submitted,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 13th, 1904.

Mr. J. S. Brady, Chairman, and Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards.

GENTLEMEN: In accordance with your request, I visited, with some of the members of your Committee, on April 9th, and again on April 12th, the dam recently built at the head of Bayou Lafourche. This inspection was made as a result of the report addressed to your Committee some ten days before, and calling your attention to the fact that the land slope of the dike showed considerable leaking and sloughing.

The examination on the two above mentioned dates showed that the leaks and sloughs had increased to a certain extent since the date of my first report to you. In corroboration of the verbal report which I made to you on the ground, I cannot say that the dike is in any apparent danger; yet it may be that with the rising river (which is going to continue rising for some ten days longer) the leaks and sloughs may increase to an alarming extent. For that reason, I recommended to you on the ground that a force be placed at once on the dike, in order that earth may be thrown in the water on the river side of said dike for the purpose of adding material to the river slope of said dike. This process, known as "*blanketting*," is familiar to you, and has generally proven effi-

cient in stopping excessive seepage and leaks. It is immaterial, in my mind, whether a wheelbarrow force or a scraper force be employed, but it is important that this force should be of sufficient magnitude (not less than 20 scrapers or 100 wheelbarrow men) and placed to work at once, so that it might be ready to meet any emergency which may arise. Any delay in this would be taking chances which I think should not be taken.

Material for this work can be procured on the land side between the bayou and the levee line, but should not be taken nearer than 150 feet from the foot of the slope of the dike. Only a limited amount of material can be found there, but a large and suitable pit exists in convenient proximity to the dike in Port Barrow, adjoining the excavation marking the old Port Barrow Fort.

Members of your Committee discussed the advisability of using a hydraulic dredge for the purpose of filling the river slope of the dike. It is well established that a hydraulic dredge could not place material on the slope of the dike, as it would necessitate placing the discharge pipe so close to the dike that there would be danger of washing away the surface of the dike itself instead of forming deposit on it. The material deposited by a hydraulic dredge would be lodged some little distance from the slope of the dike, perhaps 75 to 100 feet, and although such work would be efficient in filling up the basin in front of the dike, and thereby a desirable thing for the levee, yet it would not accomplish what, to my mind, is most needed to the dike, that is, the blanketting process, or the addition of earth to the surface of the slope itself so as to intercept and diminish the seepage and leaks. A combination of the two methods could only result beneficially; but I cannot urge too strongly the necessity of organizing and putting to work the land force without delay.

Very respectfully,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 21, 1904.

Mr. J. S. Brady, Chairman, and to the Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards.

GENTLEMEN: Enclosed please find copy of correspondence from Brig. General A. Mackenzie, Chief of Engineers U. S. Army,

Senator Samuel D. McEnery and Governor W. W. Heard, which explains itself.

I judge from this correspondence that General Mackenzie has made no opposition to the Lafourche Lock extension going through, and therefore I presume this extension of time has become a law. At the same time, it appears to be the desire of General Mackenzie, of Senator McEnery and of Governor Heard that the Atchafalaya Basin and Lafourche Basin Levee Boards should give bond for the removal of the dam at the expiration of three years from December 1, 1904.

It is evident from this that the law which has been passed by the Congress of the United States does not provide for this bond, and in fact I am under the impression, from my conversation with Representative Broussard, that such a bond would not be incorporated in the law to be passed on the subject. The Levee Boards have given bond to remove the dam on or before December 13th, 1904.

I would suggest that the Levee Boards enter into correspondence with General Mackenzie, telling him that they will endeavor to give such bond, but especially assuring him that it is the intentions of the two levee boards to comply strictly with the law, pointing out the fact that being officers of the law they have no other alternative but to obey the law, and telling him that the Levee Boards would be willing to bind themselves by resolution, or otherwise, to remove the dam at their own expense in December, 1907, if directed to do so by the Secretary of War. It might be that the War Department would be satisfied to accept such a resolution and would not require the giving of bond.

Very respectfully yours,

ARSENE PERILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Nov. 18, 1902.

Major Robt. L. Strong, General Agent Texas and Pacific Railroad Company, New Orleans, La.

DEAR SIR: Referring to our conversation of yesterday, I have to inform you that the Fifth Louisiana Levee District has about completed an embankment or levee extending from near Bougere Landing and tying on your railroad embankment at *Station 1110*. That the State of Louisiana has advertised for the

construction of a levee line joining your railroad embankment at about Station 4145 and extending along the river front to the lower line of the Witlacochee Plantation. This line leaves the railroad embankment through the Bougere Swamp, from Station 4410 to 4145, or 265 stations, to act as a levee until such time as the United States Government, or the State or District, are able to construct a levee line through the Bougere Swamp, connecting the work completed and contemplated in that vicinity.

Upon surveys made by this office, we find that the railroad embankment through the Bougere Swamp proper, which is now to act as a levee, has no margin in height above the high water of 1897, and that our wing which joins your work at the upper end stands 6 feet above your embankment; that while your embankment has an 18-foot crown, with slopes of 1½ to 1, the levee line has an 8-foot crown, with slopes of 3 to 1, with banquette 20 feet wide.

It is very plain from this statement that in case of high water your railroad would be far weaker in section and in height than the levee line. In my judgment, in order for you to contend with a high water, your embankment through Bougere Swamp should be raised not less than two feet without delay; and I would suggest that the necessary material with which to raise the embankment be brought to the work in cars, as to secure the material from either side of the embankment would materially weaken it.

I call your attention to this because in my conversation with Mr. Thorn and Settalee, before advising the Fifth Louisiana Levee District to undertake the work from Station 4410 to Bougerre, I called their attention to the fact that they would have to maintain their railroad embankment until such time as a levee could be constructed.

I would also state that the Mississippi River Commission on its recent trip down the river failed to make any special allotment for the construction of the levee through Bougere Swamp. I would also remind you of the fact that from Cut Off Bayou to Sugar House Chute, the grade of your railroad embankment drops until it is six or seven feet below the high water marks on the trees, showing that in case of any high water, even though it be but a bank-full stage in the river, the line of your railroad would be submerged, and after the completion of our line to Witlacochee, the current coming around the lower end of the levee system would wash your rails up into the trees, and practically compel you to

reconstruct your road from that point to Sugar House Chute, a distance of 12 or 14 miles. While I have no direct interest in this latter proposition, I believe that it would be greatly to the interest of your railroad to raise its grade to such an elevation as to be able to successfully operate it at all stages of the water, nor do I believe that it is within the power of the present authorities to ever give absolute levee protection against the back water of Red River, or a certain amount flowing across country from the Mississippi River towards the Atchafalaya River in high water time, as the mouth of Old River will have to be left open for an unlimited time, and with that open the water it bound to back up to about the elevation found on the timber in the swamps through which your line passes.

I would be very much obliged of you would take this matter up with the authorities of your road, knowing that our interests are common, and that with little additional expense the railroad can be operated at all stages of the Mississippi River with an intact levee system above.

With regards, I remain,

Yours very truly,

M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., March 9th, 1903.

Hon. ..... Prest. Board of Commissioners,
..... Levee District.

DEAR SIR: Information received in this office from nearly all the Levee Districts, indicates that the public levees are now being injured to an unusual extent by hauling, driving and riding over them, by the trampling of stock and by obstructed drainage.

Act No. 108 of 1888 makes it a misdemeanor to "ride, drive or haul on any public levee."

Act No. 60 of 1890, and Act No. 46 of 1894 make it unlawful for stock of any description to go on the levees, or the space between the levees and the drainage ditch, during the time that the water is against the levees, and Section 2 of Act No. 84 of 1884 authorizes the killing of "hogs found at any time, running at large upon the public levees."

Act No. 16 of 1892 prohibits the placing of obstructions on the levees, and the tying or fastening of logs or timber to them during high water.

Act No. 119 of 1902 requires the drainage of all public roads contiguous to the public levees, and prescribes penalties for obstructing such drains or ditches, whether public or private.

Act No. 98 of 1892 prohibits the flooding of lands for irrigation within five hundred feet of the levee on the Mississippi River, and the discharge of siphons within twenty-seven feet of their base, etc.

The temptation to use the levees as highways of travel—due to the present almost impassable condition of the roads—and the existing high stage of the rivers, seems to call for a stricter application and enforcement of the laws above referred to than has been customary in many places.

We have, therefore, thought this a proper occasion to again ask the attention of all the Levee Boards of the State to this important matter, and to urge that such action be promptly taken as may be necessary to prevent and correct the abuses in question.

Very respectfully,
The Board of State Engineers,
Per HENRY B. RICHARDSON,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., July 27, 1903.

Mr. Leon Lemaire, Special Committee appointed by the Town Council of New Iberia to investigate the possibilities of constructing a Ship Canal from New Iberia to Tide Water.

DEAR SIR: I beg to report to you that, in accordance with the instructions of His Excellency, W. W. Heard, Governor of Louisiana, I proceeded to New Iberia, on Saturday, July 18, 1903. I was put in possession, through your courtesy, of maps and profiles of a survey which had been made to connect the Town of New Iberia with Bayou Carlin. I examined the maps and profiles with care, and also went over the ground of the proposed line, which runs generally in a north and south direction, from New Iberia to Bayou Carlin, a distance of about ten miles. I had occasion to converse with a number of the residents of the country through which this proposed canal runs, and gathered from them such information as I thought would give me an intelligent idea of the project proposed.

I beg to state that I found the surveys and calculations outlined approximately correct. It is my belief that the canal pro-

posed could be built without difficulty and of the dimensions mentioned in the profiles referred to. This would have a bottom width of twenty (20) feet, a width at water surface of thirty-eight (38) feet, and a top width which would vary according to the depth of the cut. The slopes specified are generally one and a half horizontal to one vertical. The depth of the cut would vary from a maximum of twenty feet to a minimum of six feet. The work would consist of about 906,000 cubic yards, which certainly should be done at a price varying from eight to ten cents per cubic yard; that is, at a cost between $74,000 and $90,000. The digging is good and easy, through fairly soft material. It would only pass through a very short length of timbered swamp, and that is not of an especially heavy character.

The canal being fairly straight, and on account of its great depth, would afford excellent drainage to the country bordering it. This would be made all the better from the fact that the canal being a tide-level navigation canal, would afford a greater fall to the drains coming into it than an ordinary drainage canal would give.

I consider the project easily feasible from an engineering standpoint, and one which could be executed at reasonable cost.

I believe that with a little skill and study the bottom width of the canal could be increased, while the flatness of the slopes could be decreased with safety, thereby increasing the area of the waterway, and, with proper judgment, doing this without increasing the amount of excavation and therefore the cost of the work.

From the investigation which I have made of this proposed work, I believe it to be a very desirable one both from a standpoint of drainage and from that of the commercial prosperity of the Town of New Iberia, and I can see no special difficulty in executing it.

I shall be pleased to lend any further assistance to the project which lies within my power.

Very respectfully yours,

ARSENE PERRILLIAT,

Member Board of State Engineers.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., April 11th, 1904.

Messrs. J. K. Jeffries and Son, Contractors, Plaquemine, La.

SIRS: The receipt of your petition, relative to the Arlington Levee, in the Parish of East Baton Rouge, La., addressed to the Board of State Engineers of Louisiana, and filed by your Mr. J. K. Jeffries, on the 2nd inst., is hereby acknowledge.

The petition, on certain grounds advanced by you, requests a reconsideration by the Board of State Engineers of the basis of the final settlement made with your firm for the construction of the Arlington Levee, in the Parish of East Baton Rouge, and certain relief.

The allegations and arguments advanced by you, in palliation of your delay in completing the Arlington Levee, at the proper time, and in support of your claims for relief, may be summed up as follows, viz:

1st. Certain physical difficulties caused by the cultivation of rice over a part of the line of levee projected for construction.

2nd. The stage of the river when these difficulties no longer existed and operations were otherwise possible.

In reply, the Board of State Engineers would recall to your mind:

That you entered into contract with the State of Louisiana to build the Arlington Levee on May 19th, 1902. The contract stipulated that work should be begun on or before June 1st, 1902, and completed on or before December 1st, 1902. The survey of the line of levee, and nature of the topography of the locality were familiar to you. Your allegation that the line of levee ran through a rice field is not wholly borne out by the facts of the case. There were 2,500 feet of work through a rice field, the yardage of which amounted to about 115,000 cubic yards, and over 2,800 feet of work through a cotton field, the yardage of which amounted to about 121,000 cubic yards. If you could not have gone to work on June 1st, on that portion of the levee through the rice field, for which you had received notes, there were no physical difficulties to prevent you commencing work on that portion of the levee line that went through the cotton field.

Letters dated June 25th, and August 8th, 1902, were written to you by members of the Board of State Engineers calling your attention to the fact that up to those dates nothing had been done

towards the actual construction of the levee by you. On September 8th, about three motnhs after the work should have begun, you started work on this levee with an outfit averaging not more than 30 wheel scrapers per day for that month, although you had been advised by letter of August 8th, that if the work had been started on that day, a force of more than 100 scrapers would be required for the completion of the levee within the stipulated time, and that as the delay in beginning work went on, the force necessary for its completion within the stipulated time would become larger and larger. At no time did you have more than 59 wheel scrapers at work, and that was as late as the latter part of January, 1903, and then only for a short period.

Not until the 30th of December, 1902, nearly one month after the Arlington Levee should have been completed under your contract, did the water in the river reach the same level as the natural surface of the land at Arlington, and the culmination of that rise was on January 11th, 1903, when the level of the water in the river was about three feet above the surface of the land. The engineer in charge called your attention to the situation by letter dated December 22nd, 1902, and advised you, for your own protection, to construct at once a run around or protection levee on such lines as he located. On that day, twenty-two days after the time when the levee should have been completed, you had but 94,000 cubic yards in position, on the main levee, or only about forty per cent. of the total yardage in the contract, and but thirty-eight wheel scrapers at work, and your attention was again called to the fact that your force was entirely inadequate to complete the levee before the high water in the spring. Your attention was again called to the inadequacy of your force on this levee by letter of February 4th, 1903, at which time there were only forty-seven wheel scrapers at work.

On February 15th, 1903, the river, on its second rise, again reached the same level as the natural surface of the ground at Arlington ,and from that time on it continued to rise; and on the 20th of February your attention was called to the necessity of enlarging the protection levee to meet the increasing rise in the Mississippi River.

Rains having set in about this time, which interfered with your scraper work, you were obliged, from this time on, to employ a wheelbarrow force to complete this protection levee against the rise in the river, and on March 4th, 1903, you agreed to use convicts on this protection levee at the rate of $1.50 per day per man—

the only terms under which they would go to work on said protection levee. These convicts were on the ground as the result of agreement previously entered into by you with the Board of Control of the State Penitentiary, some time about February 20th, 1903, to build the upper and lower wings of the main line of the Arlington Levee.

The foregoing are the leading and main facts in regard to events at the Arlington Levee, during the life of your contract for its construction, bearing upon the matters at issue.

In conclusion, and to summarize the above, the Board of State Engineers, in full session, begs leave to state that under your contract the Arlington Levee should have been begun on or before June 1st, 1902, and completed on or before December 1st, 1902. Material operations were not begun on it until September 8th, 1902, and owing to the insufficiency of the force maintained by you on the work it was not completed until late in the fall of 1903, or some twelve months after the date on which it should have been completed. The hardship and expenses to which you were subjected, in protecting this work, from high water, were solely due to your failure to complete it within the time specified in the contract, which had been fixed by the Board of State Engineers with the view and purpose of avoiding the very complications which did arise, in consequence of your delay and failure to observe the specifications in regard to time.

Your attention was repeatedly called to the insufficiency of your force on the work and to the results which would probably follow therefrom, the propriety of which precaution was afterwards borne out by the actual occurrences following December 1, 1902.

The loss which you claim to have suffered is to be regretted, but was due to your failure to comply with the 1st specification of your contract, followed by conditions fully covered by specifications 3 and 10 of said contract.

Certificates of payment for every cubic yard of earth measured by the Engineer in Charge, at the completion of the work, have been issued to you, and accepted by you. The Board of State Engineers cannot grant the relief prayed for.

Very respectfully,

The Board of State Engineers,

Per FRANK M. KERR,

Chief State Engineer.

—DATA—

REGARDING THE

LEVEE DISTRICTS

—OF THE—

MISSISSIPPI VALLEY.

PREPARED FOR THE HONORABLE THEODORE ROOSEVELT, PRESIDENT OF THE UNITED STATES,

BY ARSENE PERRILLIAT.

SUMMARY OF DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

		For details see Page No.
Total Alluvial Area subject to overflow	29,790 Sq. Miles	222
Or	19,065,600 Acres	222
Total Area incorporated in Levee Districts under various State laws	26,952 Sq. Miles	
Or	17,249,642 Acres	222
Percentage of Area in Cultivation, to Total	19.7 per cent.	222
Total number of Levee Districts in Mississippi Valley	25	220
Total number of Commissioners governing same	155	228
Total length of Levee Line in Mississippi Valley on Mississippi River and its Tributaries	1,956 Miles	221
Extenson of Levee Line required	191 Miles	221
Extension of Levee Line required	191 Miles	221
of Orleans	$112,887,591	223
Assessment of Orleans	$150,055,240	223
Total Revenue for Levee building contributed in 1902 by States and Levee Districts	$2,239,754	223
Total contributed by United States Mississippi River Commission for Levee purposes for 1902	$1,000,000	223
Total amount of bonds authorized to be issued by Levee Districts for Levee building	$8,788,000	226
Total amount of these bonds already issued	$7,337,700	226
Total amount of earthwork estimated necessary to complete Levee line to Mississippi River Commission Grade	89,086,047 Cu. Yds.	227
Estimated cost of above earthwork	$17,817,198	227
Percentage of present condition of Levee line to estimated completion	65.9 per cent.	227

The following pages give the details from which the above summary was made. The figures given were gathered from the most trustworthy authorities, namely the Levee Boards' officers themselves. In a few instances, however, especially when the number of acres improved or in cultivation is touched upon, the figures are close approximations.

In a few minor instances, when the data were unobtainable, their place is filled by a question mark, thus "?".

DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

LOCAL NAME OF DISTRICT.	Distance of Upper End below Cairo. Miles.	Distance of Lower End below Cairo. Miles.	Length of River Frontage. Miles.	Bank of River on which District is situated.	State.
Reelfoot of Ky	36	56	20	East	Kentucky
Reelfoot of Tennessee	56	60	4	East	Tennessee
Yazoo-Mississippi	250	365	115	East	Mississippi
Mississippi	365	580	215	East	"
Pontchartrain	835	956	121	East	Louisiana
Orleans	956	970	14	East & West	"
Lake Borgne	970	1015	45	East	"
Grand Prairie	1015	1048	33	East	"
Plaquemines Parish E. Bank	.....	.....	.....	East	"
Bird's Point	2	70	68	West	Missouri
St. Francis of Mo.	80	128	48	West	"
St. Francis of Ark	128	295	167	West	Arkansas
Cotton Belt	.....	.....	.....	West	"
Laconia Circle	334	390	56	West	"
Red Fork (on Arkansas Riv.)	.....	.....	.....	West	"
Desha	410	440	30	West	"
Chicot	440	521	81	West	"
Tensas Basin	410	521	111	West	Louisiana
Fifth Louisiana	521	760	239	West	"
Atchafalaya Basin	765	886	121	West	"
Lafourche	886	1020	134	West	"
Buras	1020	1050	30	West	"
Red River, Atchafalaya and Bayou Bœuf	Levees situated on Red River, Atchafalaya Riv. and Bayou des Glaizes.			West bank of streams	"
Bossier	Levees situated on Red River.		109	East	"
Caddo	Levees situated on Red River.		159	West	"

DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

Local Name of District.	Length of Levee line now built in District. Miles.	Additional Length required. Miles.	Comprises the U. S. Levee District known as
Reelfoot of Ky	5½	10	Reelfoot.
Reelfoot of Tennessee	4½	None	
Yazoo-Mississippi	124	None	Upper Yazoo.
Mississippi	188⅓	None	Lower Yazoo.
Pontchartrain	123½	None	Pontchartrain.
Orleans	74½	None	In no U. S. District.
Lake Borgne	48	None	Lake Borgne.
Grand Prairie	23	8	
Plaquemines Parish E. Bank	None	32½	
Bird's Point	3½	48½	Upper St. Francis.
St. Francis of Mo	47	None	Lower St. Francis.
St. Francis of Ark	139	24	
Cotton Belt	62	2	White River.
Laconia Circle	46	.....	
Red Fork	35	6	
Desha	26½	6	
Chicot	59½	None	Upper Tensas.
Tensas Basin	86	8	
Fifth Louisiana	217	15	Lower Tensas.
Atchafalaya Basin	122 (a)	None	Atchafalaya.
Lafourche	119(b)	None	Lafourche.
Buras	34	None	Barataria.
Red River, Atchafalaya and Bayou Bœuf	117½	12	Improvement of Red Riv
Bossier	58	4	Improvement of Red Riv
Caddo	82	15	Improvement of Red Riv
Totals	1956.3	191	

(*a*) Has built and maintains in addition 120 miles of levee, of which 75 miles are situated on Bayou Lafourche, and 45 miles on the Atchafalaya River.

(b) Has built and maintaisn in addition 75 miles of levees on Bayou Lafourche.

DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

LOCAL NAME OF DISTRICT	Total Area of District, Acres	Area Improved or in Cultivation, Acres	Area Unimproved or in Forest, Acres	Percentage Cultivated, Area to Total Area
Reelfoot of Ky	200,000	50,000	150,000	25
Reelfoot of Tennessee	120,000	25,000	95,000	30
Yazoo-Mississippi	2,656,000	.....	2,071,680	28
Mississippi	1,660,000	584,320	1,120,000	38
Pontchartrain	363,000	121,000	242,000	33
Orleans	120,960	24,932	96,028	20
Lake Borgne	112,000	27,000	85,000	24
Grand Prairie	11,000	3,000	8,000	27
Plaquemines Parish E. Bank	15,642	3,000	11,742	25
Bird's Point	143,000	70,000	73,000	49
St. Francis of Mo	378,240	78,648	302,592	20
St. Francis of Ark	1,058,240	211,648	846,592	20
Cotton Belt	582,400	?	?	.....
Laconia Circle	150,000	18,000	132,000	14
Red Fork	215,000	15,000	200,000	7
Desha	194,560	9,728	184,832	5
Chicot	392,000	?	?	.....
Tensas Basin	2,755,000	287,000	2,468,000	11
Fifth Louisiana	1,529,000	230,223	1,299,377	15
Atchafalaya Basin	2,541,000	635,250	1,905,750	25
Lafourche	796,000	134,000	562,000	17
Buras	40,000	12,000	28,000	30
Red River, Atchafalaya and Bayou Bœuf	944,000	48,000	886,000	5
Bossier	128,640	?	?	.....
Caddo	143,360	?	?	.....
Totals	17,249,642	3,125,649	12,777,593	19.7

DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

Local Name of District.	Assessment for 1902.	Revenue for 1902 from District Taxation.	Additional Revenue from State Appropriations.	Levee Allotments by U. S. Miss. River Commission.
Reelfoot of Ky.	?	$25,000	.....	$20,000
Reelfoot of Tennessee	$1,500,000	?	.....	.....
Yazoo-Mississippi	20,919,585	393,339	.....	70,000
Mississippi	17,000,000	345,661	.....	291,000
Pontchartrain	6,179,449	117,840	$25,000	81,500
Orleans	150,055,240	140,542	10,000	.....
Lake Borgne	1,670,284	23,127	5,000	10,000
Grand Prairie	179,890	7,242	3,000	.....
Plaquemines Parish E. Bank	265,025	10,000	.....	.....
Bird's Point	?	7,000	.....	20,000
St. Francis of Mo	2,052,654	16,697	.....	125,000
St. Francis of Ark	20,000,000	112,000	.....	.....
Cotton Belt	?	?	.....	90,000
Laconia Circle	?	2,600	.....	.....
Red Fork	250,000	3,382	.....	.....
Desha	400,000	3,387	.....	.....
Chicot	?	?	.....	112,000
Tensas Basin	3,284,130	24,617	28,886	.....
Fifth Louisiana	6,097,873	204,286	65,096	110,000
Atchafalaya Basin	15,379,660	271,307	25,000	40,000
Lafourche	10,633,208	167,381	20,000	20,000
Buras	431,078	6,652	5,000	10,000
Red River, Atchafalaya and Bayou Bœuf	3,947,785	64,041	15,000	.....
Bossier	1,416,150	25,190	15,000	.....
Caddo	1,280,320	28,621	15,000	.....
Totals	$262,942,831	$2,001,772	$237,982	$1,000,000

DATA REGARDING THE LEVEE DIS-

Revenue Derived from

Local Name of District	Ad valorem Tax: Mills per Dollar	Land Tax per Acre	Railroad Tax per mile	On Cotton
Reelfoot of Kentucky	5			
Reelfoot of Tennessee	?			
Yazoo-Mississippi	15¾ to 11¾	4½c	$2 to $20	.....
Mississippi	5	5c	$25 to $100	1-5c per lb of lint. 1-15c per lb of seed.
Pontchartrain	10	3c	$100	50c per bale.
Orleans	1	.....	.....	.....
Lake Borgne	10	5c	$60	25c per bale.
Grand Prairie	10	(1)	$30	25c per bale.
Plaquemines Parish, E. Bank.	5	40c	.....	25c per bale.
Bird's Point	.....	(2)	.....	.....
St. Francis of Missouri	2 p.c. on a betterm't of $2 per acre.	.....	2 p.c. on a betterment of $1000.	.....
St. Francis of Arkansas	2 p.c. on a betterm't of $3 per acre.	.....	$45	.....
Cotton Belt				
Laconia Circle	10	None		
Red Fork	20	.....	.....	.....
Desha	8	.....	$16	
Chicot				
Tensas Basin	5	.....	.....	.....
Fifth Louisiana	10	5c	$20 to $100	$1 per bale.
Atchafalaya Basin	10	2½c	$60	25c per bale. 2c per 100 lbs. seed.
Lafourche	10	2½c	$50 to $100	25c per bale.
Buras	10	5c	$30	25c per bale.
Red River, Atchafalaya and Bayou Bœuf	10	5c	$60	.....
Bossier	10	5c	$60	50c per bale.
Caddo	10	5c	$60	50c per bale.

(1) $1.00 on every arpent of frontage on Mississippi River.
(2) 40 per cent. upon the benefits assessed

TRICTS OF THE MISSISSIPPI VALLEY.

Taxation as follows:

On Sugar	On other Produce	Revenue from District taxation applied to assessment represents a tax of
.....	All State Licenses duplicated and charged for.	18.7 mills
.....	.....	20.3 "
15c per bbl., 50c per hhd., 5c per bbl. molasses.	3c per sack rice.	20.0* "
.....	.....	1.9* "
10c per bbl., 35c per hhd., 5c per bbl molasses, and 7½c per bbl of syrup.	2½c per bbl rice, 2½c per bushel oranges, ½c per bushel esculents.	14.8* "
10c per bbl., 25c per hhd., 5c per ton sugar cane, 7½c per bbl syrup, 5c per bbl molasses.	5c per bbl rough rice, 3c per bbl oysters, 3c per bbl esculents, 5c per bbl oranges.	41.2* "
10c per bbl., 35c per hhd., 5c per ton sugar cane, 7½c per bbl. syrup, 5c per bbl molasses.	5c per bbl rice, 5c per bbl oranges, 3c per bbl fruit, 3c per bbl vegetables.	37.7 "
.....	.....	.....
.....	.....	8.1 "
.....	.....	5.6 "
.....	.....	20.0 "
.....	.....	8.4* "
.....	.....	34.5* "
25c per 1,000 lbs., 4c per ton sugar cane, 7½c per bbl syrup, 5c per bbl molasses.	1¼c per sack rough rice.	18.6* "
10c per bbl., 35c per hhd., 5c per ton sugar cane, 3c per 100 lbs sugar, 7½c per bbl syrup, 5c pr bl molases	2½c per sack rough rice, ½c per bu esculents, 2½c per bbl oranges, 2½c per sack oysters.	16.7* "
5c per ton sugar cane.	2½c per bbl oysters and esculents, 5c per bbl rice and oranges.	18.7* "
.....	.....	17.2* "
.....	.....	18.7* "
.....	.....	23.3* "

NOTE—To the figures marked thus "*" one mill general State levee tax is added.

DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY.

LOCAL NAME OF DISTRICT	Bonds Authorized by law to be issued for levee building.	Bonds already issued
Reelfoot of Ky	$ 100,000	$ 100,000
Reelfoot of Tennessee	100,000	100,000
Yazoo-Mississippi	1,075,000	1,049,000
Mississippi	1,150,000	1,150,000
Pontchartrain	1,000,000	786,000
Orleans	500,000	325,000
Lake Borgne	100,000	100,000
Grand Prairie	30,000	25,000
Plaquemines Parish E. Bank	135,000	135,000
Bird's Point	263,000	100,000
St. Francis of Mo	150,000	None
St. Francis of Ark	1,000,000	750,000
Cotton Belt	?	?
Laconia Circle	?	14,000
Red Fork	None	
Desha	None	
Chicot	?	?
Tensas Basin	150,000	69,000
Fifth Louisiana	500,000	500,000
Atchafalaya Basin	1,000,000	850,000
Lafourche	500,000	250,000
Buras	35,000	35,000
Red River, Atchafalaya and Bayou Bœuf	500,000	500,000
Bossier	200,000	199,900
Caddo	300,000	299,800
Totals	$ 8,788,000	$ 7,337,700

DATA REGARDING THE LEVEE DISTRICTS OF THE MISSISSIPPI VALLEY

Local Name of District	Number of Cubic Yards in present levee line	Total Cubic Yards there should be in line to bring to M. R. C. grade	Deficiency in yardage to bring to M. R. C. grade	Percentage of present condition with regard to completed line	Approximate amount of money required to build up deficiency
Reelfoot of Ky	382,682	2,305,414	1,722,792	25.3	$ 344,558
Reelfoot of Tennessee	....	....	....	....	....
Yazoo-Mississippi	20,872,878	27,668,531	6,795,653	75.4	1,359,130
Mississippi	43,242,456	33,242,456	13,434,970	71.2	2,686,994
Pontchartrain	14,578,759	14,578,759	4,460,013	76.5	692,009
Orleans	....	....	....	....	....
Lake Borgne	3,402,634	4,896,743	1,496,089	69.5	299,316
Grand Prairie	....	....	....	....	....
Plaquemines Parish E. Bank	....	....	....	....	....
Bird's Point	385,898	5,462,548	5,076,650	7.1	1,015,330
St. Francis of Mo	13,965,898	24,497,661	10,532,583	.57	2,106,516
St. Francis of Ark	....	....	....	....	....
Cotton Belt	7,718,965	16,638,218	8,919,253	46.4	1,783,850
Laconia Circle	....	....	....	....	....
Red Fork	....	....	....	....	....
Desha	29,092,848	45,328,486	16,235,638	64.2	3,247,126
Chicot	....	....	....	....	....
Tensas Basin	....	....	....	....	....
Fifth Louisiana	17,947,083	28,831,072	100,883,989	62.2	2,176,796
Atchafalaya Basin	19,411,930	24,751,338	5,339,408	78.4	1,067,660
Lafourche	8,125,872	10,788,722	2,662,850	75.3	532,570
Buras	2,879,868	4,406,027	1,526,159	65.4	305,330
Totals	172,206,931	261,292,978	89,086,047	65.9	$17,817,198

DATA REGARDING THE LEVEE DIS' TS OF THE MISSISSIPPI VALLEY.

Local Name of District.	Number of Commissioners composing Levee Board.	Domicile of Board of Commissioners.	District comprises entire Counties or Parishes of	District comprises parts of Counties or Parishes of
Reelfoot of Kentucky	5	Hickman, Ky.		Fulton.
Reelfoot of Tennessee	3	Tiptonville, Tenn.		Lake, Dyer and Obion.
Yazoo-Mississippi	12	Clarksdale, Miss.	Tunica, Coahoma, Quitman and Sunflower.	De Soto, Tallahatchie, Deflore, Holmes and Yazoo.
Mississippi	6	Greenville, Miss.	Bolivar, Washington, Issaquena and Sharkey	Warren.
Pontchartrain	9	Convent, La.		E. Baton Rouge, Iberville, Ascension, St. James, St. John, St. Charles and Jefferson.
Orleans	9	New Orleaas, La.	Orleons	
Lake Borgne	3	St. Bernard Court House, La.	St. Bernard	Plaquemines.
Grand Prairie	3	Pointe a la Hache, La.		Plaquemines.
Plaquemines Parish, E. Bank	5	Pointe a la Hache, La.		Plaquemines.
Bird's Point	3	Charleston, Mo.		Mississippi.
St. Francis of Missouri	9	Caruthersville, Mo.	Pemiscot	Dunklin and New Madrid.
St. Francis of Arkansas	24	West Memphis, Ark.	Mississippi and Crittenden	Craighead, Peinsett, Cross, Lee and Phillips.
Cotton Belt	?			
Laconia Circle	3	Laconia, Ark.		Desha and Phillips.
Red Fork	3	Red Fork, Ark.		Desha.
Desha	3	Arkansrs City, Ark.		Desha.
Chicot	?		Chicot	
Tensas Basin	7	Monroe, La.	Catahoula, W. Carroll, Franklin, Morehouse & Richland.	
Fifth Louisiana	8	Delta, La.	E. Carroll, Tensas, Madison and Concordia.	
Atchafalaya Basin	7	Port Allen, La.	Pt. Coupee, W. Baton Rouge and Terrebonne.	Iberville, Ascension, Assumption, Lafourche, Iberia, St. Mary and St. Martin.
Lafourche	9	Gretna, La.		Assumption, St. James, St. John, Lafourche, St. Charles, Jefferson and Plaquemines.
Buras	5	Buras, La.		Plaquemines.
Red River, Atchafalaya and Bayou Boeuf	3	Alexandria, La.		Rapides, Avoyelles and St. Landry.
Bossier	7	Bossier City, La.		Bossier.
Caddo	7	Shreveport, La.		Caddo.

Length of Levee Line in Louisiana and in part of Arkansas protecting Louisiana.

Name of State Levee Districts	Miles on Mississippi R.	Miles on Bayou Lakourche	Miles on Athafalaya R.	Miles on Red River	Miles on Other Streams	Total Miles by Districts
Tensas Basin	.....	.....	.....	.....	a 40.0	40.0
Fifth Louisiana	232.3	.....	.....	.....	b 39.0	271.3
Atchafalaya Basin	128.1	75.0	41.9	.....	.....	245.0
Pontchartrain	125.6	.....	.....	.....	.....	125.6
Lafourche Basin	119.4	74.1	.....	.....	.....	193.5
Orleans	26.5	.....	.....	.....	c 48.0	74.5
Lake Borgne Basin	48.6	.....	.....	.....	.....	48.0
Grand Prairie	29.3	.....	.....	.....	.....	29.3
Buras	33.7	.....	.....	.....	.....	33.7
Caddo	.....	.....	.....	79.2	d 9.0	88.2
Bossier	.....	.....	.....	57.1	.....	57.1
Red River, Atchafalaya and Bayou Bœuf	.....	.....	29.4	36.8	e 48.0	114.1
Cat Island	12.8	.....	.....	.....	.....	12.8
State of Arkansas, protecting Louisiana	71.8	.....	.....	.....	f 28.0	99.8
Outside of Levee Districts	.....	.....	.....	31.8	.....	31.8
Totals by streams	827.5	149.1	71.3	204.9	212.0	1464.8

a Includes 10 miles on Ouachita, 17 miles on Black and 13 miles on Little River.
b Includes 12 7 miles on Black and 26.3 miles on Tensas River.
c Rear Levees, etc.
d All on Bayou Pierre
e All on Bayou des Glaizes.
f Includes 15.0 miles on Arkansas River below Red Fork and 13.0 miles on Amos Bayou and Cypress Bayou (cross line.)

Office Board State Engineers,
New Orleans, La., April, 1904.

STATIONS.	Elevation of Gage Zero above Cairo Datum Plane.	Highwater, 1897. Date.	Gage Reading.	Highwater, 1903. Date.	Gage Reading.	Highest Water of Record. Year.	Gage Reading.
MISSISSIPPI RIVER.							
St. Louis, Mo.	400.23	May 2nd.	30.90	Mch. 11th	25.2	1844	41.4
Cape Girardeau, Mo.	324.97	Apl. 12th and 13th.	31.60	Mch. 12th	28.4	1892	35.0
Cairo, Ill.	290.84	Mch. 25th to 28th	51.70	Mch. 15th-17th	50.6	1883	52.2
Columbus, Ky., Belmont, Mo.	286.76	Mch. 26th to 30th	45.00	Mch. 16th-19th	44.4	1883	45.6
New Madrid, Mo.	275.72	Mch. 29th	40.27	Mch. 16th-18th	39.5	1884	41.5
Cottonwood Pt., Mo.	250.67	Mch. 21st-23rd	39.35	Mch. 20th-21st	40 0	1903	40.0
Fulton, Tenn.	228.55	Mch. 23rd	37.47	Mch. 19th	40.1	1903	40.1
Memphis, Tenn.	203.97	Mch. 20th	37.66	Mch. 21st	40.1	1903	40.1
Mhoon Ldg., Miss.	181.48	Apl. 4th	41.60	Mch. 25th-26th	41.8	1903	41.8
Helena, Ark.	161.98	Apl. 4th	51.75	Mch. 26th-27th	51.0	1897	51.75
Sunflower Ldg., Miss.	147.08	Mch. 27th	47.17	Mch. 27th-28th	48.00	1903	48.00
Mouth of White River, Ark.	128.73	Mch. 29th	52.42	Mch. 28th-29th	53.7	1903	53.7
Arkansas City, Ark.	116.44	Mch. 29th	51.90	Mch. 27th-28th	53.0	1903	53.0
Greenville, Miss.	108.00	Mch. 29th	46.75	Mch. 27th	49.1	1903	49.1
Lake Providence, La.	89.62	Mch. 30th	44.54	Mch. 27th-28th	46.4	1903	46.4
Vicksburg, Miss.	66.04	Apl. 16th	52.48	Mch. 27th-29th	51.8	1897	52.48
St. Joseph, La.	52.74	Apl. 17th	47.85	Mch. 27th-29th	48.0	1903	48.0
Natchez, Miss.	36.89	May 2nd	49.82	Mch. 28th, Apl. 1st-2rd and 4th	50.4	1903	50.4
Red River Ldg., La.	23.85	May 14th-15th	50.20	Apl. 8th and 9th	50.0	1897	50.2
Bayou Sara, La.	23.95	May 13th-15th	43.70	Apl. 8th-10th	43.4	1897	43.7
Baton Rouge, La.	20.06	May 13th-15th	40.65	Apl. 6th-10th	40.0	1897	40.65
Plaquemine, La.	21.06	May 13th-17th	36.25	Apl. 5th and 8th	36.1	1897	36.25
Donaldsonville, La.	19.48	May 13th	32.75	Apl. 4th to 10th	32.2	1897	32.75
College Pt., La.	21.24	May 15th	27.95	Apl. 5th to 7th	27.8	1897	27.95
Carrollton, La.	20.91	May 13th	19.17	Mch. 26th to 29th, Apl. 5th-8th	19.4	1903	19.4
New Orleans, La.	18.73	May 13th	19.50	Mch. 30th, Apl. 6th and 7th	20.3	1903	20.3
Fort Jackson, La.	19.26	Apl. 22nd-29th, May 14th-16th	7.2	Apl. 2, 5, 6, 7, 8, 12, 13	8.0	1903	8.0
ATCHAFALAYA RIVER.							
Barbres Ldg., La.	24.17	May 13th-14th	50.95	Apl. 7th-12th	50.60	1897	50.95
Melville, La.	20.17	May 15th	36.10	Apl. 4th	38.7	1903	38.7
		High Water 1892 Date	Guage reading	High Water 1902 Date	Guage reading		
RED RIVER.							
Fulton, Ark.	244.78	Mch. 23rd-24th	34.80	Nov. 30th, Dec. 1st	32.20	1876	35.75
Shreveport, La.	161.27	May 28th	35.70	Dec. 15th-16th	34.10	1892	35.70
Alexandria, La.	64.46	June 12th-13th	38.25	Dec. 24th	34.20	1892	38.25

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REPORT

OF THE

Board of State Engineers

OF THE

STATE OF LOUISIANA

TO

HIS EXCELLENCY, NEWTON C. BLANCHARD,

GOVERNOR OF LOUISIANA,

FROM

APRIL 20, 1904, to APRIL 20, 1906.

BATON ROUGE,
THE TIMES, OFFICIAL JOURNAL OF THE STATE OF LOUISIANA.
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Board of State Engineers

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., April 20, 1906.

To His Excellency, Newton C. Blanchard, Governor of Louisiana:

SIR—The Board of State Engineers has the honor to submit for your Excellency's information the following report, with accompanying appendices, covering the period from April 20, 1904 to April 20, 1906.

DUTIES AND PERSONNEL OF THE BOARD.

The Board of State Engineers was created by Act 33, approved February 10, 1879. The duties of the Board, as defined by this act, are to make surveys of watercourses, public works and levees of the State; to "report to the Governor of the State the improvements necessary and the levees to be constructed, which are of prime importance to the State at large;" to furnish estimates and specifications of the work so required; to examine and measure the work recommended by the Board, and done under contracts made by the State, and to certify the amount of payments due for work thus executed.

Under the provisions of later laws the Board has been made, in general terms, the engineers and advisers of sixteen out of the seventeen Boards of Levee Commissioners so far organized in the State, viz.:

1. The Fifth Louisiana Levee District, by Act 44 of 1886.
2. The Tensas Basin Levee District, by Act 59 of 1886.
3. The Red River, Atchafalaya and Bayou Bœuf Levee District, by Act 79 of 1890.
4. The Pontchartrain Levee District, by Act 95 of 1890.
5. The Atchafalaya Basin Levee District, by Act 97 of 1890.
6. The Lafourche Basin Levee District, by Act 13 of 1892.

7. The Lake Borgne Basin Levee District, by Act 14 of 1892.
8. The Caddo Levée District, by Act 74 of 1892.
9. The Bossier Levee District, by Act 89 of 1892.
10. The Buras Levee District, by Act 18 of 1894.
11. The Cat Island Levee District, by Act 110 of 1894.
12. The Grand Prairie Levee District, by Act 24 of 1898.
13. The Plaquemines Parish East Bank Levee District, by Act 7 of 1902.
14. The Courtableau Levee District, by Act 166 of 1902.
15. The Mermentau Levee District, by Act 79 of 1904.
16. The Red River and Bayou des Glaizes Levee and Drainage District, by Act 109 of 1904.

In addition to the field operations, and the great number of tours of inspection constantly demanded from the members of the Board of State Engineers in the performance of their routine duty, over two hundred meetings of the Boards of Commissioners of these various levee districts, at the domiciles of the Boards, and at other places, were attended during this period by members of the Board of State Engineers, submitting reports, detailed and general information, and advising upon all matters referred to the Board.

The Orleans Levee District was created by Act 93 of 1890; but under the provisions of Act 79 of 1892 the only duty of the Board of State Engineers is to approve or disapprove the "location, construction and repairs of all levees on the river front of said District."

Act 144 of 1888 makes it the duty of the Board "to furnish such lines and levels, plans and estimates as may be considered necessary for the proper and efficient execution of the work" to be done by the Board of Control of the New Basin Canal.

Article 294 of the Constitution of 1898 directs that the Board, "whenever called on so to do, shall furnish the different road districts with plans and specifications for public roads, and such assistance and advice as will tend to create a uniform system of public roads throughout the State;" and under Article 239 it devolves upon the Board, in certain cases, to give to or withhold from the Boards of Commissioners of the several levee districts of the State authority to contract with or permit steam railroad corporations to construct, maintain and operate railroad tracks upon the public levees.

The Board has continued, as called upon by the joint organization of the Atchafalaya Basin and Lafourche Levee Boards, provided for under Act 9 of 1900, to make the numerous surveys, with plans, specifications, etc., necessary for the improvement of the channel in Bayou Lafourche, as authorized or required by this act and by Act 84 of 1902; and also by other Levee Boards and Police Juries to continue examinations and surveys for a number of extensive drainage works proposed or undertaken by them.

Act 61 of 1904 requires the recommendation and approval by the Board of State Engineers of all public drainage channels, selected by Boards of Commissioners of drainage districts when such districts desire to exercise control over their drainage channels, and for one hundred feet each side thereof, whether such channels have been improved by drainage districts, or adopted without improvement as necessary parts of or extensions to improved drainage channels. This has called for many examinations by the Board of State Engineers during the past two years, and, as the benefits of drainage become more and more apparent, projects for its further development must grow materially in number and extent, and require additional attention and consideration from the department.

In addition to the general administration of the affairs of the department thus outlined, as specified by law and passed into practice by precedent, the Board of State Engineers has, during this period, been called into service on a number of occasions in matters of advice and direction by, and to make surveys and perform engineering work for, the following public institutions, viz.: The Board of Control of the State Penitentiary; the Insane Asylum of Louisiana, at Jackson, La.; and the Soldiers' Home, at Camp Nicholls, New Orleans, La. Also by your Excellency on matters relating to the location and establishment of the annual military encampments of the State, to the concessions, privileges and rights of way sought by the Louisiana Railway and Navigation Company, at the State Farm, at Angola, La., and at New Orleans; in regard to the "Frisco Railroad" at New Orleans; in the matter of the Carondelet Canal and Navigation Company, and at Port Chalmette, in the matter of its slips and terminals at that point; and in the interest of the Progressive League of Shreveport, in the matter of the Caddo Gas Fields.

The performance of these duties has required the constant care and attention of the members of the Board of State Engineers during the past two years, and, in addition to the office force proper,

has required the regular employment of three surveyors, and as many rodmen as assistants in the field, as well as the temporary services of other employees both in the field and in the office.

The amount of engineering work necessary for the examinations, surveys, estimates, plans and reports requisite for prosecuting the numerous works executed or projected by the various levee districts, and the additional duties devolving upon the Board by new undertakings authorized or provided for at each successive session of the Legislature, continues to increase and to largely augment the expenses as well as the care and labor involved. The appropriations made for the necessary mileage, assistance and expenses of the Board of State Engineers have, hence, become insufficient to fully meet the increased demands for surveys and office work. For the efficient performance of the duties and engineering work now demanded from the Board it is, therefore, necessary that a larger sum than heretofore be appropriated from the General Engineer Fund.

During the period covered by this report the several members of the Board of State Engineers have given their attention, as heretofore, to the affairs of all the levee districts, and to duties in any of them as the occasion required. As a matter of convenience, however, the engineering work in the Pontchartrain, the Lafourche Basin, the Lake Borgne Basin, the Buras, the Grand Prairie and the Plaquemines Parish East Bank Levee Districts, and in the matter of the "Frisco Railroad," with regard to its slips and terminals at Port Chalmette, has received the special attention of Assistant State Engineer Lewis. Assistant State Engineer Perrilliat has performed the duties required for the work of the Atchafalaya Basin Levee District, and has attended to most of the work called for by the Board of Control of the New Basin Canal and Shell Road, by the joint organization of the Atchafalaya Basin and Lafourche Levee Boards for the improvement of Bayou Lafourche, the concessions, privileges and rights of way sought from the State by the Louisiana Railway and Navigation Company, the construction work done by this railroad company at Angola, and the location and establishment of the annual military encampments of the State. Assistant State Engineer Robertson has given special attention to the work in the Fifth Louisiana Levee District, and to that of the Tensas Basin Levee District in Arkansas; and Assistant State Engineer Lombard has attended to the work in the Caddo, the Bossier, the Red River, Atchafalaya and Bayou Bœuf

Levee Districts, and the Red River and Bayou des Glaizes Levee and Drainage District.

Levee Work of the Past Two Years.

The work of improving the public levees in Louisiana, and of those directly protecting Louisiana in the lower counties of Arkansas, has been continued during the period since our last biennial report by the several levee districts, by the State, and by the United States.

The total amount of this work done between April 20, 1904, and April 20, 1906, by the United States, the State and the levee districts, is shown in the following table:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the levee districts	39.54	57.66	4,279,460	$ 832,743.23
By the State of Louisiana	25.60	38.95	3,054,392	457,597.16
By the United States	11.03	112.12	4,701,982	846,405.83
Aggregates	76.17	208.73	12,035,834	$2,136,746.22

As regards locality, the work may be divided as follows:

LOCALITY	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
IN ARKANSAS				
On the Arkansas River	2.70	12.33	627,256	$ 111,583.39
On the Mississippi River	------	48.15	763,938	168,076.60
IN LOUISIANA				
On the Mississippi River	29.62	125.12	7,974,679	1,434,926.92
On the Red River	30.39	4.60	1,676,659	243,385.00
On the Atchafalaya River	5.85	11.89	818,224	154,254.99
On the Gulf Coast	7.61	------	126,889	11,952.43
Interior Levees	------	6.64	48,189	12,566.89
Aggregates	76.17	208.73	12,035,834	$2,136,746.22

The foregoing tables do not include the drainage work done during this period by the Red River, Atchafalaya and Bayou Bœuf Levee District, costing about $69,274.68, all of which class of work so far undertaken has been completed. Nor do they include the work for the improvement of Bayou Lafourche, by a lock, dam and other channel improvements, which have been undertaken by the joint organization of the Atchafalaya Basin and Lafourche Levee Districts, on which some $265,000 has been expended up to date, leaving some $350,000 still involved to complete the project as originally conceived and designed.

There remains, in addition to the above, under contracts of the State and the several levee districts, now in course of execution, an amount of levee work still to be done estimated to aggregate not less than 3,900,000 cubic yards of earthwork, and to cost not less than $650,000. (See Appendix "A" for detailed statement.)

A considerable amount of work was also done and expenditures incurred by the levee districts and by the United States for weed cutting, minor repairs, auxiliary works of various descriptions, and for wooden revetments, for which the information is not in all particulars at hand to base a positive statement, but which aggregates a considerable sum. During the period of this report the expenditure for protection work during high water has been less than at any time in the history of the State.

Details relative to the location, character, extent and cost of the levee work of the past two years will be found in the paragraphs of this report headed the "Levee Districts," and in tabular form in Appendix "A."

The Levee System.

The system directly protecting Louisiana includes not only the public levees within the State, but also those in Arkansas south of the Arkansas River. Levees have been built by the State of Louisiana and its several levee districts, at one time or another, on the Mississippi, Red, Ouachita, Black, Little Tensas and Atchafalaya Rivers, and on Bayous Rapides, des Glaizes, Bon Idee, Courtableau and Lafourche, within the State; and in Arkansas, on the Mississippi and Arkansas Rivers, and on Cypress Creek and Amos Bayou. But, since the great improvement of levees made in the last twenty-four years on the Mississippi River above the mouth of Red River, those on the Black and Ouachita Rivers and their tributaries have

become of minor importance, because of the more complete exclusion from their basins of overflow from the Mississippi.

Levee work for a number of years past has, therefore, been principally applied on the Mississippi, Red and Atchafalaya Rivers, and on Amos Bayou, Cypress Creek, Bayou des Glaizes and Bayou Lafourche. The closure of Bayou Lafourche, at its head, by a temporary dam in December 1903, pending the construction of a lock, will hereafter render the maintenance of a levee system some one hundred and sixty miles in length on that stream unnecessary. (See "Bayou Lafourche.")

At present the principal lines of continuous levee protecting the alluvial lands of Louisiana against overflow are as follows:

1. From the highlands near Pine Bluff, Ark., down the right bank of the Arkansas River to within about five miles of the mouth of the Old Arkansas River, aggregating some 95 miles in length. At this point an extension, some 2.5 miles in length, is under contract by the United States Government, along Dry Bayou towards the main line of the levees constituting the head of the Mississippi River levees, which, when completed, will reduce the gap between the Mississippi and Arkansas River levee systems to about 3.5 miles. This extension, at this date, has about 65 per cent. of its final contents in position.

2. From Costello's Gin, a point on Amos Bayou—about five miles south of Red Fork and about twelve miles west of the mouth of the Arkansas—a continuous line of levee extends down the left bank of Amos Bayou about five miles; thence—crossing Boggy Bayou—to the right bank of Cypress Creek about 1.5 miles; thence about six miles down the right bank of Cypress Creek to Lucca Landing, on the Mississippi River, where it joins the levee system on the right bank of the Mississippi River; and thence continuing down through Desha and Chicot Counties, Ark., and the Fifth Louisiana Levee District to near Bougere Landing, in Concordia Parish, about 296.5 miles below; thus making one unbroken line from Costello's Gin, Ark., to Bougere Landing, La., about 309 miles in length.

Immediately below the latter point a gap in the levee line, known as Bougere Crevasse, has existed since 1866, but below this gap, now reduced to a width of some 5.5 miles, the public levee line is again continuous for a distance of about 13 miles to Point Breeze, which is within about 8 miles of the mouth of Old River, generally referred to as the mouth of Red River. This will no doubt, as it

should, constitute the lower terminus of this system of levees, until such time as the project for divorcing the Red and Atchafalaya Rivers from the Mississippi River takes definite shape and is finally provided for.

It is also the pleasant privilege of the Board of State Engineers to be able to herein record, in this connection, that during the past year a contract was let by the United States for the construction of 4.78 miles of the 7.28 miles of new levee required to close Bougere Crevasse, and that about 1.75 miles of the work undertaken has already been completed. It is also understood that the completion of the work undertaken by the United States at Bougere in 1905 would not only be vigorously prosecuted as soon as the stage of water in the Mississippi River would permit, but that there is reason to believe that contracts for the construction of the remaining 3 miles of this great work will be let during the year, and every endeavor made to secure the completion of the entire line before the spring floods of 1907.

3. From Torras Landing, at the mouth of Red River (or more properly the mouth of Old River), the levee extends down the right bank of the Mississippi River, without break or interruption, to the outlet known as the Jump; that is, to within about 10 miles of the Head of the Passes, a length of 288.1 miles.

And from the same point at Torras Landing, the levee line runs along the south bank of Old River 7 miles to Barbre's Landing; and thence down the left bank of the Atchafalaya River, to and across Sherman's Bayou, a length of about 42 miles. These lines thus form a continuous system on the Atchafalaya, Old and Mississippi Rivers, 337.1 miles in length.

4. On the left bank of the Mississippi River, the levee line extends uninterruptedly from Baton Rouge to what is known as the Lucas Canal, about 7 miles below Fort St. Philip, a length of 216.6 miles.

5. The upper levee system of the Caddo Levee District, on the right bank of Red River, extends from Blanton Bluff, Ark., about 1.5 miles above the Louisiana line, to Gold Point, a length of about 45 miles of levee.

6. The lower system of the Caddo Levee District—also on the right bank of Red River—extends from the Bluffs, on the north side of Bayou Pierre, to the lower limits of Caddo Parish, a length of about 35 miles of levee.

7. The levees of the Bossier Levee District, on the left bank

of Red River, extend from Hurricane Bluff to Dennison Plantation, a length of about 54 miles.

Below this, the natural banks of Red River, in Bossier Parish, are, except at Ninock Bayou and Swift Chute Bayou, generally high enough, as compared with the high water of the past, to restrain all but very extreme floods, occurring, in the light of history, at long intervals of time. Both of these streams, however, have been closed by the district by substantial levees.

8. The upper levee system of the Red River, Atchafalaya and Bayou Bœuf Levee District is continuous from the highlands of Bayou Rapides—about one and a half miles above the mouth of the bayou—down the bayou to its junction with Red River, at Alexandria, about 1.5 miles; and thence down Red River to the Avoyelles Prairies, at David's Ferry, 35.3 miles in length, or a total for the upper system of 36.8 miles.

9. The lower system of the Red River, Atchafalaya and Bayou Bœuf Levee District is continuous on the right bank of Bayou des Glaizes, from "The Junction," about 9 miles above Moreauville, down the bayou to its junction with the Atchafalaya River, at Simmsport, about 48 miles; and thence down the Atchafalaya River to a point about 7.5 miles below Melville, a length of 34.1 miles, making a total of 82.1 miles of levee for the lower system, and an aggregate of 118.9 miles for the entire district.

10. The levee system of the Red River and Bayou des Glaizes Levee and Drainage District will involve the construction of lines of levee on Red River, the Atchafalaya River and on Bayou des Glaizes, aggregating, probably, 125 miles in length; but, as active operations in the district were inaugurated only within the past year, the percentage of line so far completed is, comparatively speaking, so small that it cannot yet be taken into account in summing up the length of effective levee line in the State.

11. The levee system of the Plaquemines Parish East Bank Levee District is intended to exclude the overflow waters of the Gulf of Mexico from that portion of the Parish of Plaquemines included in the Lake Borgne Basin and Grand Prairie Levee Districts, extending from the upper line of Harlem Plantation to the upper bank of the Cuselich Canal, on the property of Peter Cuselich, below the Old Quarantine Station, and, when completed, will be some 33 miles in length. Owing to the failure of two firms of contractors, previous to the firm operating under the contract at present in force, to successfully prosecute the work undertaken by

them, no part of this line is yet actually completed, and also cannot yet appear in the length of effective levee line in the State.

The aggregate length of levee lines thus, more or less, protecting Louisiana at this time is 1,472.8 miles; 99.8 miles of which are in the State of Arkansas, and the remainder, 1,373.0 miles, in Louisiana, divided according to districts and streams, as follows:

LENGTH OF LEVEE LINE IN LOUISIANA AND IN PART OF ARKANSAS PROTECTING LOUISIANA.

NAME OF STATE LEVEE DISTRICTS	Miles on Mississippi River	Miles on Bayou Lafourche	Miles on Atchafalaya River	Miles on Red River	Miles on Other Streams	Total Miles by Districts
Tensas Basin	------	------	------	---------	(a) 40.0	40.0
Fifth Louisiana	237.3	------	------	---------	(b) 39.0	276.3
Atchafalaya Basin	128.1	75.0	41.9	---------	---------	245.0
Pontchartrain	125.6	------	------	---------	---------	125.6
Lafourche Basin	119.4	74.1	------	---------	---------	193.5
Orleans	26.5	------	------	---------	(c) 48.0	74.5
Lake Borgne Basin	48.0	------	------	---------	---------	48.0
Grand Prairie	30.4	------	------	---------	---------	30.4
Buras	33.7	------	------	---------	---------	33.7
Caddo	------	------	------	79.2	(d) 9.0	88.2
Bossier	------	------	------	54.3	---------	54.3
R. R., A. & B. B.	------	------	34.1	36.8 (g)	(e) 48.0	118.9
Cat Island	12.8	------	------	---------	---------	12.8
State of Arkansas protecting Louisiana	71.8	------	------	---------	(f) 28.0	99.8
Outside of Levee Districts	------	------	------	31.8	---------	31.8
Totals by Streams	833.6	149.1	76.0	202.1	212.0	1472.8

(a) Includes 10.5 miles on Ouachita River, 17 miles on Black River, and 13 miles on Little River.

(b) Includes 12.7 miles on Black River, and 26.3 miles on Tensas River.

(c) Rear levees, etc.

(d) All on Bayou Pierre.

(e) All on Bayou des Glaizes.

(f) Includes 15 miles on Arkansas River, below Red Fork, and 13 miles on Amos Bayou and Cypress Bayou (cross line).

(g) Includes 1.5 miles on Bayou Rapides.

THE CONSTRUCTION OF LEVEES.

The period covered by this report has been signally marked by a continued satisfactory improvement in the grade and cross-section of the lines of public levee treated in the State, the work

accomplished having generally been done substantially in accordance with the requirements prescribed by the recognized authorities—United States and State—and thought, with intelligent care and maintenance, to be sufficient for the demands of the future, except, possibly, along that part of the Mississippi River extending from the State line to the vicinity of Delta, La., and from the vicinity of New Orleans to the mouth of the river. Along these lengths of the river higher grades than those prescribed will undoubtedly be eventually required.

The bulk of the earth moved in building the levees of the State is still handled by scrapers drawn by mules, assisted, in some instances, by wagons and graders. During the past two years, however, some 17.8 per cent. was wheeled into position by men with wheelbarrows; while as much as 12.6 per cent. was done by power-driven machinery, in the form generally of clam-shell land dredges, with long booms, carried usually on tracks, but, in some instances, on pontoons. The balance, 69.6 per cent., was handled, as usual, by scrapers drawn by mules.

The average cost of the levee work performed by the State and the levee districts, by all methods, during the past two years, has been 17.59 cents per cubic yard; and by the three methods named, as follows: By scrapers drawn by mules, 17.64 cents per cubic yard; by men with wheelbarrows, 18.96 cents per cubic yard; and by power-driven machinery, 15.41 cents per cubic yard.

Taking into consideration the amount, character and location of the earthwork thus done under the three methods named, the average price per cubic yard which has prevailed under each, and the liberal encouragement accorded to such operators as have so far appeared in the field, the application of earth-moving machinery to all classes and conditions of levee building has not been as general, nor has its influence in reducing the cost of levee work to the levee districts and the State been as great as had been hoped for, by this time, by the Board of State Engineers. The attention of engineers and contractors to the more successful development and application of earth-moving plants as an economic and reliable factor in assuring the further progress of levee work, and materially assisting in ultimately making the defenses of the State against overflow impregnable, is, therefore, again earnestly invited.

In connection with the subject of construction, it would appear pertinent, at this time, to call attention, in a general way, to

certain conditions on the Mississippi River, below New Orleans, with reference to a servitude to which the lines of levee, on both sides of the river, practically throughout their length, are subjected,that is not common to lines of levee on other parts of the river.

In addition to being called upon, under all conditions, to resist the direct pressure of water against their slopes, and to suffer the wear and tear of the elements, the abuses of travel, stock, hogs, roadways, pathways, etc., during most all other times of the year, they have to contend against the battering of waves from the high winds of the gulf, and the cutting roll from the propellers of the great ocean steamers, steadily growing, with the demands of commerce and the march of progress, in number, size and speed —the most efficient embankments, in all other respects, often threatening to succumb to attacks from these two sources.

It, therefore, appears to the Board of State Engineers that the protection of the lines of levee below New Orleans, by revetments constructed under approved plans and methods, should, wherever known to be necessary, be, in the future, considered as a material part of their construction, in order to better insure their immediate efficiency, as well as their preservation and maintenance.

Supervision, Care and Maintenance of Levees.

The pressing and critical work of construction proper having so far generally engaged and almost entirely absorbed the attention, efforts and resources of the levee districts of the State, the correlative proposition of supervision, care and maintenance has not everywhere yet received that material thought and consideration which it unquestionably demands.

It has so far been primarily imperative, on the part of all interested, to build and enlarge—the care and preservation of the work accomplished being generally regarded as a matter of secondary consideration, and, in consequence, has, in many localities, been more or less neglected.

The Board of State Engineers regards this to be an unwise policy to longer pursue, and urges a more serious consideration of the subject in the future.

There exists in the State, today, nearly 1,500 miles of levees, monuments to the foresight, broad-mindedness, courage and energy

of our people, but it cannot be recorded that the safeguards against their abuse and deterioration provided by law, and often even those which common sense alone would dictate, have everywhere yet been taken advantage of, nor put into practice.

The levee districts of the State and the police juries of parishes within the levee districts are specifically charged by law with the duty of protecting, preserving and maintaining the public levees of the State, no matter by whom constructed; but, for the most part, in the greater number of the levee districts, the authorities in this respect are making but partial effort, and, in some, none whatever.

The Board of State Engineers, therefore, feels it incumbent upon itself to herein lay some stress on this fact, and put itself on record by reiterating its often expressed views on the subject, and again urging that the time has, beyond question, arrived when these official bodies should no longer delay the serious consideration and formulation of plans for systematically, comprehensively, economically and effectively fulfilling their sworn obligations in this particular.

Systematic organization for the constant supervision, care and maintenance of the levee lines must, sooner or later, be adopted, not only by the levee districts, but by the United States as well, and the sooner the better. Work of a more or less serious character, and of greater or less extent, in one place and then another, along all the lines of levees in the State, is needed throughout the course of the year.

Without, at this time, going into any specific details of method and appliance, this should be undertaken and performed by permanent forces, suitably organized and properly equipped, on lines similar in most respects to the railroad section-gang system.

The various classes of work required being also peculiar to the season, each class should and could be thus disposed of during the season when the best results would follow. These section gangs could be made the nucleus of high water forces in the spring; then, upon the subsidence of the waters, of repair forces, to perform all work of a minor character incident to and following periods of high water, such as removing drift, restoring wave-wash, drainage, resodding embankments, where necessary, and collecting and storing all tools and materials. All weed cutting could, at the proper time, also be done by such gangs, the patrolling of the levees at all times, as well as seeing that the laws for their

preservation and maintenance are strictly and impartially enforced, and generally perform other auxiliary work, even to assisting engineering parties engaged in field operations.

THE LEVEE DISTRICTS.

Since the last biennial report of this Board, the Mermentau Levee District and the Red River and Bayou des Glaizes Levee and Drainage District have been created by Acts 79 and 109, respectively, of 1904, increasing the number of levee districts from fifteen to seventeen. All these districts possess corporate powers, exercised under the administration of Boards of Commissioners, varying in number from three to nine; and all, except the Orleans Levee District, are empowered to levy *ad valorem* taxes for levee purposes, not exceeding the constitutional limit of ten mills on the dollar, and to impose local assessments on lands. The Orleans Levee District is restricted to an *ad valorem* tax of one mill on the dollar. Most of the districts also have power to levy assessments or forced contributions upon agricultural products raised within their territory, and upon railroads of standard gauge, while some of them, the boundaries of which touch upon the Gulf coast and bays, may impose a local assessment or forced contribution upon oysters. All of the levee districts have authority to issue bonds. The aggregate of district levee bonds now authorized in all the districts is $5,690,000, of which $4,466,700 is, at this date, outstanding. The total assessed valuation of the same levee districts (exclusive of the Cat Island, Courtableau and Mermentau Levee Districts, in which no local levee assessments have yet been made), as shown on the tax rolls of 1905, is $242,439,597.

The Tensas Basin Levee District is composed of the Parishes of Morehouse, West Carroll, Richland, Franklin and Catahoula, with those portions of Ouachita and Caldwell Parishes lying east of the Ouachita River. The district is more exposed to overflow by flood waters escaping from the Mississippi and Arkansas Rivers, in Arkansas, than from any other source, and its work continues to be applied mostly to the construction and improvement of levees in Desha and Chicot Counties, Ark., as is contemplated in the act under which the district was organized.

The United States "Upper Tensas District" includes the same levee line, and the larger part of the levee work done on this levee line since 1881 has been by the United States.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of seven members, one being appointed from each parish, or part of parish, in the district.

The domicile of the Board is at Monroe, Ouachita Parish, La.

The authorized bonded debt of the district is $150,000, of which $78,000 is, at this time, outstanding.

The assessed valuation, on the tax rolls for 1904 and 1905, was $4,107,234 and $5,034,832, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments, at the rate adopted by the district for these years—five mills on the dollar—was $45,710.33, and the actual amount of the tax paid into the State Treasury, during 1904 and 1905, was $41,341.52. In addition to this resource of the district, 10 per cent. of the General Engineer Fund (one mill general State tax) is required by law to be set aside and expended annually in the interest of the district. This item, for the years 1904 and 1905, amounted to $48,630.54, or a total for those years of $89,972.05 for all purposes in the district.

The amount and cost of the levee work done in the district, and that part of Arkansas affecting the district, during the past two years, by the district and the United States, is as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	------	6.90	219,302	$ 49,095.00
By the United States	2.70	53.58	1,171,892	230,564.99
Totals	2.70	60.48	1,391,194	$279,659.99

In addition to the foregoing, the district has expended $500 in minor repairs, and for the care, preservation and protection of its lines of levee, generally.

During the flood of 1903, the gauges at Arkansas City, Ark., and Greenville, Miss., were 1 foot and 2.4 feet, respectively, higher than at any previous time. Long stretches of levee affecting the Tensas Basin Levee District were thus found to be below this high water mark, and were first topped, and, afterward, enlarged to a grade 2 to 3 feet above it. The entire line from Costello's Gin to the State line between Louisiana and Arkansas, with the exception of

about 14 miles, has now been provided for up to that grade. Of this work, the Tensas Basin Levee District is doing about 13.5 miles, the United States Government about 12.5 miles, and the Chicot Levee Board has completed about 2 miles, about 14 miles still remaining to be enlarged.

In addition to the work done on the main line of levees in Arkansas, a spur was built at Leland Neck, opposite Greenville, Miss., and paid for by the Tensas Basin Levee District. The object of this spur was to prevent a cut-off at that point. This spur, which is now about 6,500 feet long, has since been materially enlarged and effectively protected by the Government.

The levee lines affecting the Tensas Basin Levee District are generally free from travel and well sodded. In Desha County, Ark., however, hogs are roaming at large and doing considerable damage, and the authorities are apparently making little or no effort to correct this evil. The levee laws of Arkansas are very crude—Desha County alone being divided into five levee districts, none of which employs regularly either an engineer or an inspector. Hence the levees of the State located beyond the jurisdiction of the Mississippi River Commission and the United States District officers deteriorate rapidly. It is unfortunate that the alluvial counties in Arkansas south of the Arkansas River are not organized in one levee district on lines governing in all well conceived and regulated levee districts. In view of this lack of thorough organization, and the uncertain state of affairs usually incident thereto, it is hoped that the extension now under construction by the Government south of the mouth of the Arkansas River will not be carried beyond the point so properly indicated and adopted by the Mississippi River Commission; but, on the contrary, any means that may be available for extensions in Arkansas be applied to the Amos Bayou levee line, westward to a point above ordinary overflows, also looked upon with favor by the Mississippi River Commission.

New levees will be required this season at Chicot Front, 6 miles above Arkansas City, and at Grand Lake, immediately above the dike across the lake. Below will be found a statement of the estimated contents of the new levees and enlargements required, to which reference has been made:

NAME OF STRETCH	Linear Ft.	Cubic Yds.	REMARKS
	ENLARGEMENT		
Panther Forest to Belleview 1614-1854	24,000	265,000	Includes spur at 1670, 15,000 cubic yards. From 1624 to 1669 M. R. C. Grade, 12 foot crown, 3 and 3 to 1 slopes.
Luna 1910-1942	3,200	30,000	
Whiskey Chute 2400-2562	16,200	120,000	2530 to 2562 M. R. C. Grade, 12 foot crown, slopes 3 and 3 to 1.
Mathews Bend 3410-3671	26,100	185,000	
		600,000	
	NEW LEVEES		
Mathews Bend	10,000	420,000	Banquette included.
Chicot Loop	7,200	370,000	
Total new levees		790,000	
Total enlargement		600,000	
Grand total		1,390,000	

The Fifth Louisiana Levee District is composed of the Parishes of East Carroll, Madison, Tensas and Concordia.

The levee line of the northern part of the district, above a point opposite Warrenton, Miss., is included in the United States "Upper Tensas District," and the southern part coincides with the United States "Lower Tensas District."

The district has a frontage on the Mississippi River of 235 miles, and a continuous levee line of about 224.5 miles, covering 207 miles of river front. Below the end of this line of continuous levee—near Bougere Landing—there is an unleveed gap of about 5½ miles, known as Bougere Crevasse, part of which is, at this time, under contract for construction by the United States, and immediately below this gap a line of levee, about 13 miles in length, now exists, which brings the lower end of the levee system of this district to within 8 miles of the mouth of Red River.

The affairs of the district are conducted by a Board of Levee Commissioners, composed of eight members, two from each parish.

The authorized bonded debt of the district, all of which is outstanding, is $500,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $6,962,290 and $9,437,908, respectively.

The total possible amount of the *ad valorem* or mill tax collect-

ible on these assessments, at the rate adopted by the district for these years—ten mills on the dollar—the maximum permitted by the Constitution of the State, was $164,001.98. During the years 1904 and 1905, collections amounting to the sum of $132,-681.37 from the *ad valorem* or mill tax, and of $298,298.90 from the forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $195,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district, for this period, apparently some $625,380.27.

The amount and cost of the work done in the district during the past two years, by the district, the State and the United States, is approximately as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	5.68	11.84	1,039,402	$215,412.48
By the State	4.33	11.31	996,685	147,841.39
By the United States	5.88	13.80	1,408,129	290,614.59
Totals	15.89	36.95	3,444,216	$653,868.46

In addition to the foregoing, the district expended $9,555.47 in minor repairs, and for the care, preservation and protection of the levees; also $676.13 in protection work, during high water.

The general condition of the levee line in the district is fair, the width of crown averaging about 8 feet, with side slopes of 3 and 3 to 1. Some few stretches of line have been simply topped, and, on the other hand, along some 4 miles of its length, the side slopes on the river side are as flat as 4 to 1. Considerable work has, in the past, been done on the levees in the way of banquettes, there being no less than 25 miles of banquette in East Carroll, 14 miles in Madison, 8 miles in Tensas, and ½ mile in Concordia; but, owing to the abuse to which they are annually subjected by travel, this class of work has now been mostly discontinued, until such time, in the future, when the line may be brought to the grade and section approved by the Mississippi

River Commission. These banquettes are generally from 12 to 15 feet below the top of the levee line, and some 20 feet wide. In winter, and during high water, the roads next to the levee are, owing to defective foundation, almost impassable. Hence the difficulty of keeping travel away from banquettes offering better facilities for travel, to their great injury and insecurity, at times when they should be in the best condition. However, the law in this respect is being gradually enforced, and the public roads themselves are being removed from the vicinity of the levee.

Complaint has also to be made in regard to fences crossing the levees in a number of localities. It is a great benefit for levees to be fenced for pasturage, but where fenced simply for purposes of cultivation it is an injury, inducing, by the exclusion of stock, the growth of weeds, briars, saplings, etc., and the destruction of its covering of Bermuda grass, and entailing upon the district annually a great deal of expense in weed cutting, restoring rain-wash, regrassing, etc.

Another great abuse to which the levees in the district are, in many places, subjected, is in the form of stock paths and ramps. There are no less than 250 such places in the line of levee in the district, requiring attention at this time.

The river front of the district lies along a stretch of the Mississippi River, where more changes have taken place in the banks than in any other stretch of river of equal length. The banks in the bends of the river generally cave back from 400 to 600 feet a year on an average, and locations for new levees cannot, in consequence, be depended upon for many years. The length of levee line thus subject to caving banks aggregates about 125 miles, nearly one-half the length of line in the district on the Mississippi River, averages some 20 feet in height, mostly in heavy timber and undrained swamps, and, therefore, involves great difficulty in construction and cost.

Sloughing is recently very frequent in embankments under construction, causing great additional expense and anxiety. Such places, if not removed and rebuilt, seldom cease to slough.

The district will, this season, require new levees at Mascot, Sycamore and Duckport, and within another season at Morancy, Bedford, Palo Alto, L'Argent, Fish Pond and Fairview. Also the enlargement of Willow Point Loop and Lake Palmyra.

In Concordia Parish the United States Government has made an allotment of $325,000 towards the closure of Bougere Crevasse.

It is estimated that as much as $200,000 more will be required to complete the levee. The embankment at Bougere, when completed, will contain some 2,000,000 cubic yards of earthwork, closing a serious gap in the levee line that has remained open since 1866, and inundated no less than 1,000 square miles of rich territory. Such a stupendous undertaking has always been beyond the means of the State and district, struggling for many years past to maintain 200 miles of weak levees above Bougere, and the present result is the fruition of a hope of a large number of people in Concordia, Catahoula, Avoyelles and Tensas Parishes.

The United States has, so far, successfully revetted Elton, Kempe and Giles Bends, thus conferring a great and lasting benefit upon the district. It is to be hoped that further efforts in this direction, where needed, may be found practicable and profitable.

The Atchafalaya Basin Levee District is composed of the entire Parishes of Pointe Coupee, West Baton Rouge and Terrebonne; and of parts of the Parishes of Iberville, Ascension, Assumption, Lafourche, St. Martin, St. Mary and Iberia.

The district coincides with the United States "Atchafalaya Levee District."

The district has a frontage on the right bank of the Mississippi River of 122 miles, extending from Torras to Donaldsonville; on Old River of 7 miles; and on the Atchafalaya River of about 139 miles, along its left bank, from Barbre's to its mouth, and of about 87 miles on its right bank, extending from the upper line of St. Martin Parish to the mouth of the river. Of this, only about 40 miles of the left bank of the river, from Barbre's to Alabama Bayou, are leveed. The lengths of line in the district are: On the Atchafalaya River, 41.9 miles; on Old River, 7 miles, on the Mississippi River, 121.1 miles, and on Bayou Lafourche, about 75 miles. Since December 10, 1903, however, Bayou Lafourche has been divorced from the Mississippi River by the construction of an earthen dam, preliminary to the construction of locks; and, therefore, the bayou is no longer directly subject to the fluctuations which rendered a levee line necessary along its banks. Under the terms of Act 84 of the General Assembly of 1902, however, this line of levee on Bayou Lafourche must be left undisturbed and must, therefore, continue to be regarded as a charge to the district.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of seven members, three of whom are appointed from the Mississippi River parishes, three from the interior parishes, and one at large, on the recommendation of the railroads of the district.

The domicile of the Board is at Port Allen, West Baton Rouge Parish, La.

The authorized bonded debt of the district is $1,000,000, of which $850,000 is, at this time, outstanding.

The assessed valuation of the district on the tax rolls of 1904 and 1905 was $16,615,037 and $20,257,206, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $368,723.43. During the years 1904 and 1905, collections amounting to the sum of $320,660.43, from the *ad valorem* or mill tax, and of $261,568.99, from forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $80,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district, for this period, apparently some $662,229.42.

The following tables give the length, contents in cubic yards, and cost of the work done, during the past two years, in the Atchafalaya Basin Levee District, by the district, the State and the United States:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
ON THE MISSISSIPPI RIVER.				
By the District	3.64	14.72	1,253,349	$262,676.22
By the State	0.21	3.93	148,547	22,207.93
By the United States	------	7.59	357,626	71,587.43
Totals	3.85	26.24	1,759,522	$356,571.58

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
ON THE ATCHAFALAYA RIVER.				
By the District	1.45	8.85	402,048	$ 76,389.12
By the State	0.47	3.04	112,191	17,221.31
Totals	1.92	11.89	514,239	$ 93,610.43
RECAPITULATION THROUGHOUT THE DISTRICT.				
By the District	5.09	23.57	1,655,397	$339,065.34
By the State	0.68	6.97	260,738	39,429.24
By the United States	------	7.59	357,626	71,587.43
Totals	5.77	38.13	2,273,761	$450,082.01

In addition to the foregoing the district has expended $10,081.53 in minor repairs and for the care, preservation and protection of the levees in the district. Also $86.20 in high water protection work during the high water.

During the past two years the Board of Commissioners for the Atchafalaya Basin Levee District has spent nearly all of its revenues in enlarging its levees on the Mississippi and Atchafalaya Rivers, and in building such new levees as were rendered necessary by caving banks. The same has been done with the funds allotted to the district from the General Engineer Fund.

Enlargement work undertaken by the district has been carried on generally in the lower end of the district, between Baton Rouge and Donaldsonville; and on the Atchafalaya River, between Humphreys Bayou and Sherman Bayou. The enlargement work on the Mississippi River levees, between Baton Rouge and Torras, the upper end of the district, has generally been carried on by the United States from funds allotted by the Mississippi River Commission. The work has generally been built to Mississippi River Commission grade, which is 4.4 feet above the high water of 1897 at Torras Landing, and 4.2 feet above the high water of 1897 at Donaldsonville. The work has been built with a crown 10

feet wide and slopes of three horizontal to one vertical on both land and river sides, when the levee was under 15 feet; and slopes of three horizontal to one vertical on the river side, and four horizontal to one vertical on the land side, when the levee was higher than 15 feet.

New levees have been built during this period at Texas, Eliza, Lefebvre, St. Francis Church, Comeaux, Upper Bayou Goula, Palto Alto, Plaquemine, Lower Smoke Bend, and new levees are in process of construction at Lower Bayou Goula and Nodaway.

New levees will have to be undertaken this year at Torras, New Texas, Medora, White Castle, Upper Smoke Bend and, possibly, at Hickey, Dorcyville and Cora, should the caving now threatened at those points develop the necessity.

On the Mississippi River, at the present writing, 113.05 miles of levee are up to Commission grade, leaving 15.05 miles still to be raised and enlarged to Commission grade.

On the Atchafalaya River, the entire line from Barbre's Landing to Sherman Bayou has been built to the grade and section adopted by the district, with the exception of 4.75 miles, which are under contract, and are being raised to the grade and section required. It is the policy of the Board to extend the levee line on the Atchafalaya River beyond its present terminus, situated just below Sherman Bayou, but the location to be adopted is yet unsettled, owing to topographical difficulties involved in building a dike across Alabama Bayou. This extension of the system, however, will be carried on as soon as the present Atchafalaya line is brought to the required grade and section.

At the request of the Board of Commissioners for the Atchafalaya Basin Levee District that portion of the General Engineer Fund allotted to the district has been spent to complete the Lakeland contract on the Mississippi River; to build the Milam new levee and enlargement on the Atchafalaya River, and to place under contract the enlargement of the Morganza levee on the Mississippi River.

The Board of Commissioners of the Atchafalaya Basin Levee District proposes to continue the work of enlarging and strengthening its levees until they reach such height and section that they will afford absolute safety to the district, no matter how great the floods of the future may be. The district estimates that, with its present revenues, and allotments it hopes to receive annually from State funds and United States appropriations, it will take about nine years to bring about this most desirable result.

The Cat Island Levee District, in the Parish of West Feliciana, was created by Act 110 of 1894. It comprises the territory on the east bank of the Mississippi River, from Ratcliff's Landing to Bayou Sara. The act provided for the appointment of five Levee Commissioners, and authorized the issuance of bonds to the amount of $100,000.

As stated in previous reports, surveys have shown that the cost of levees necessary for the protection of this district would be excessive as compared with the probable revenues, and that, even after building an effective levee system, the drainage of the district during prolonged seasons of high water could only be maintained by the operation of costly pumping machinery. Under these circumstances, no action has ever been taken by the Commissioners for raising funds or for undertaking levee work. The act under which the district was created has never been repealed; and it still remains, as heretofore, a levee district only in name.

The Pontchartrain Levee District is composed of the alluvial lands on the east bank of the Mississippi River, between the cities of Baton Rouge and New Orleans, consisting of parts of the Parishes of East Baton Rouge, Iberville, Ascension, St. James, St. John, St. Charles and Jefferson. Its situation is so favorable as to make it dependent for protection solely upon the integrity of its 126 miles of levee on the Mississippi River front, and its "Upper Protection Levee," 1,526 feet in length, built along the lower boundary limit of the City of Baton Rouge, and extending from the main line of levee, on the Mississippi River, back to the highlands.

The district is included in the United States "Pontchartrain District."

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of nine members, one from each parish in the district, and one representative, respectively, of the Illinois Central Railroad Company, and of the Louisville, New Orleans & Texas Railway Company.

The domicile of the Board is at Convent, St. James Parish, La.

The authorized bonded debt of the district is $1,000,000, of which $795,000 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1904 and 1905 was $7,496,370 and $9,264,467, respectively.

The possible amount of the *ad valorem* or mill tax collectible on

these assessments was $167,608.37. During the years 1904 and 1905, collections amounting to the sum of $133,598.57, from the *ad valorem* or mill tax, and of $105,004.86 from the forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $56,000 were also made from the General Engineer Fund by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district, apparently some $294,603.43.

The amount and cost of the work done in the district, during the past two years, by the district, the State and the United States, was, approximately, as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	0.21	5.07	127,681	$ 19,544.79
By the State	2.09	3.45	345,941	46,284.09
By the United States	1.26	21.75	1,263,692	180,348.14
Totals	3.56	30.27	1,737,494	$246,177.02

In addition to the above, the district has expended in minor repairs, and for the care, preservation and protection of the levees of the district, $13,121.22.

The condition of the levees in the district has been very much improved in grade and section since the high water of 1903, which was six-tenths of a foot lower than that of 1897, the highest water on record, at Baton Rouge, the upper end of the district. The high water of 1903 was, however, two-tenths of a foot higher than that of 1897 at Carrollton, the lower end of the district. Out of the 21.62 miles of the 126 miles of the levee line, which in 1903 stood less than a foot above the high water of 1897, some 20 miles have since been raised and enlarged. When all the present outstanding contracts are completed over 79% of the levee line of the district will be up to standard grade and section, as shown in detail in Appendix "B."

During this period considerable care and attention have been given by the Levee Board to the maintenance of its line of levee, in the cleaning of the levees of weeds, the drainage of the borrow pits and the restoring of wave-wash. The work has been done by contract and under direct supervision of the State Engineer in charge, and has so far proved to be the most effective and economical method of doing work in the district.

The Lafourche Basin Levee District is composed of all the alluvial lands, except the Parish of Orleans, lying between Bayou Lafourche, the Mississippi River and the Gulf of Mexico, namely, parts of the Parishes of Ascension, St. James, St. John, St. Charles, Jefferson, Plaquemines (to the lower line of Riceland Plantation), and of Assumption and Lafourche (as far down as the lower limits of "Cher Ami Canal").

The district is included in the United States "Lafourche District" and part of the United States "Barataria District."

The length of the levee line in the district, on the Mississippi River, is 119.4 miles, and on Bayou Lafourche 74.1 miles.

As in the case of the Atchafalaya Basin Levee District, the Lafourche Basin Levee District is no longer directly subject to overflow from Bayou Lafourche, rendering a levee line along its banks unnecessary, so long as the dam at the head of the bayou, at Donaldsonville, is maintained, or locks be substituted therefor. But, as in the Atchafalaya Basin Levee District, this line of levee must, under the terms of Act 84 of the General Assembly of 1902, also remain undisturbed, and, therefore, continue to be classed as a responsibility to the district.

The domicile of the Board is at Gretna, Jefferson Parish, La.

The authorized bonded debt of the district, all of which is outstanding, is $500,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $11,423,739 and $12,573,832, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $239,975.71. During the years 1904 and 1905 collections amounting to the sum of $212,952.25 from the *ad valorem* or mill tax, and of $138,287.81 from the forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $57,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from

taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district for this period, apparently some $408,240.06.

The amount and cost of the work done in the district during the past two years, by the district, the State and the United States, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	0.08	2.89	55,476	$11,208.71
By the State	0.65	7.18	160,427	23,430.91
By the United States	0.97	11.10	408,094	56,604.06
Totals	1.70	21.17	623,997	$96,243.68

In addition to the foregoing the district has expended $83,560.83 in revetments, minor repairs, for the care, preservation and protection of the levees of the district, and in protection work during high water.

The levees in the district have been very much improved in grade and section during the past two years, and when the contracts at present in force are completed 82% of the levee line will be up to Mississippi River Commission grade. In the Parish of Plaquemines, below the City of New Orleans, however, where the high water of 1903 along the upper portion of the parish stood eight-tenths of a foot, and at Riceland, at the lower end of the district, over over one foot higher than the highest previous water, which was that of 1897, the levees along this portion of the district are in consequence too low and deficient in section, and should be raised and enlarged to a grade three feet above the high water of 1903, as already recommended by the Board of State Engineers.

This line of levee, some 35 miles in length, has latterly also been subjected to a greater strain than was formerly the case, due to earlier occurrence and longer periods of duration of high water, to prevailing winds and storms, and the wash of waves from the plying of large ocean steamers, yearly increasing in size, speed and number. The levees, therefore, have to be protected by wooden revet-

ments at a considerable cost to the district. The Levee Board has spent in the last two years some $60,000 on this character of work, placed in position under its own supervision and direction. The Board of State Engineers recognizes that these levees, wherever exposed to these conditions, should be revetted. The work, however, should be done in a more substantial, permanent and economical manner than is usually the practice, under contract and in accordance with plans and specifications furnished by it, and be executed under the supervision of the State Engineer in charge.

The cleaning of the levees of weeds, the drainage of the borrow pits, and the restoring of wave-wash have, in some parishes in the district, been well done; but the supervision, care and maintenance of the levees in the district as a whole have not received the full consideration which is demanded.

The Orleans Levee District was created by Act No. 93 of the General Assembly of 1890. Under this act the Parish of Orleans was "formed into a public levee district."

The public levee lines of the district lie on both sides of the Mississippi River—that on the left or east bank being 12.62 miles, and that on the right or west bank 13.88 miles in length. The district also maintains lines of "rear protection levees," aggregating about 48 miles in length.

The affairs of the district are conducted by a Board of Commissioners consisting of nine members, seven being appointed by the Governor of the State and two (the Mayor and the Commissioner of Public Works of the City of New Orleans) being *ex officio* members of the Board.

The domicile of the Board is at New Orleans, La.

The authorized bonded debt of the district is $500,000, of which $121,000 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $161,418,964 and $173,803,330, respectively.

The gross possible revenue from these sources was $335,222.29. In addition to this the sum of $10,000 is required by law to be transferred to the district annually from the first collections of the General Engineer Fund.

During the years 1904 and 1905 collections to the amount of $304,766.88 from the one mill tax were made and paid into the State Treasury.

From the tabulated statement in Appendix "A," kindly fur-

nished by request by the Board of Commissioners of the Orleans Levee District, it will be seen that expenditures for levee purposes have, during the past two years, been made by the district as follows, viz.:

Earthwork: 39,063 linear feet of enlargement, containing 77,773 cubic yards, and costing $30,353.49.

Revetment: 4,598 linear feet of revetment, amounting to 206,675 feet board measure, and costing $6,998.38.

Sundry material accounts and repairs, $16,527.52.

General maintenance and repair of levees, etc., $65,687.66.

Making a total expenditure by the district, during the period covered by this report, for the items above mentioned of $119,567.15.

In addition to the statement of expenditures furnished, the Board of State Engineers is further indebted to the Board of Commissioners of the Orleans Levee District for the following general résumé of the progress of levee improvement in the district and of the present status of its lines of levee:

"From the Upper Protection Levee down to Napoleon Avenue, about 4 1-3 miles, the levees are all about 3 feet above the highest water, and have good sections, are well drained and in perfect condition.

"From Napoleon Avenue to Clouet Street, about 5 1-2 miles, known as the Commercial Front, considerable work has been done during the past two years by this Board, the Dock Board and the different railroads. The river front, from Napoleon Avenue to Louisiana Avenue, is occupied by the Illinois Central Railroad docks, which were destroyed by fire since our last report to you, and which have since been reconstructed, with bulkheads from 1.5 to 2 feet above high water. Along the stretch from Louisiana Avenue to Clouet Street, about 4.5 miles, new wharves have been constructed by the Dock Board for over 6,000 feet, and the levees in the rear have been raised to the established grade by this Board, with such slopes as the conditions would permit. The above does not include the new Second Street Levee, which is about 580 feet in length and built in accordance with the resolution adopted by the Board of State Engineers, Dock Board and Orleans Levee Board. The different railroads have raised about 1,000 feet of levee front in the First District, from Thalia to Calliope Streets, and this Board is now engaged in placing earth behind the wharves now under construction, which are about 4,000 feet in length.

"At the present rate of progress, at least 80 per cent. of the Commercial Front will be raised to the standard by the end of this year.

"The levees of the Third District, from Clouet Street to the lower parish line, about 2.3 miles, are protected by pile bank protection, which has required considerable repairs during the past two years. The narrowness of the space upon which to construct the levees behind this work has prevented, in some cases, the proper section being given the levees. It was the intention of this Board to have enlarged and strengthened the levees in the district during the past season, but the stage of the river prevented the contemplated improvements, which will, no doubt, be finished next season.

"The levees of the Fifth, or Algiers, District, are all in good condition, and are from 2 to 3 feet above the high water of 1903. These levees are thoroughly drained and free from weeds and high grass, due to the constant care taken of them by the day forces of the district.

"Since the installation of the Drainage System considerable work has been done along the banks of the Navigation and Drainage Canals. Over six miles have been completed and other work is contemplated soon.

"This rear protection work has reclaimed the large section of swamp land lying between Metairie Ridge and the Lake, from the New Basin Canal to the Orleans Tail Race, an area amounting to about 1,100 acres."

The Lake Borgne Basin Levee District is composed of the alluvial lands on the east bank of the Mississippi River below the City of New Orleans, situated in the Parish of St. Bernard, and in that part of the Parish of Plaquemines lying north of the lower line of Bohemia Plantation.

The district is included in the United States "Lake Borgne District."

The length of the levee line of the district, all fronting on the Mississippi River, is 48 miles.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of three members, one from each parish in the district, and one represenative of the New Orleans and Southern Railroad Company.

The domicile of the Board is at New Orleans, La.

The authorized bonded debt of the district, all of which is outstanding, is $100,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $2,019,197 and $2,280,314, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $42,995.11. During the years 1904 and 1905, collections amounting to the sum of $38,010.88 from the *ad valorem* or mill tax, and of $16,029.32 from the forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $20,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district, for this period, apparently some $74,040.20.

The amount and cost of the work done in the district during the past two years by the State was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the State	1.77	------	106,229	$18,316.12

The district has expended $16,321.30 in outfits, minor repairs, revetments, for the care, preservation and protection of the levees of the district, and in protection work during high water.

The levees in the district have been very much improved in grade and section during the past two years, but there remains considerable work yet to be done to bring them to a grade 3 feet above the highest water known—namely, that of 1903—as recommended by the Board of State Engineers. This stage of water stood against these embankments from eight-tenths of a foot, in the upper end of the district, to over one foot at the lower line of the district, at Bohemia, higher than the highest previous water—namely, that of 1897.

The 48 miles of levee in this district are also subjected to a greater strain from floods, which latterly occur at a much earlier period and are of much longer duration than was formerly the

case; and, owing to prevailing winds and storms, as well as the wash of waves from the plying of large ocean steamers, yearly increasing in size, speed and number, have to be protected by wooden revetments at considerable cost to the district. The Levee Board has spent, in the last two years, over $10,000 for this character of work, placed in position under its own supervision and direction.

As it is recognized by the Board of State Engineers that these levees, wherever exposed to these conditions, should be revetted, it is suggested that the work should be done in a more substantial, permanent and economical manner than is usually the practice, and under contract, in accordance with plans and specifications furnished by it, and executed under the supervision of the State Engineer in Charge.

The cleaning of the levees of weeds, the drainage of borrow pits, and the restoring of wave-wash have been well done, but the supervision, care and maintenance of the levees as a whole have not received that full consideration which is demanded.

The Grand Prairie Levee District is composed of the alluvial lands subject to overflow on the left or east bank of the Mississippi River, embraced within the Parish of Plaquemines, from the lower line of Bohemia Plantation to the lower line of Baptiste Collette Gap.

The district is included in the United States "Lake Borgne District."

The length of levee line of the Mississippi River front required for this district is 33.3 miles. The length of the existing line at this time is 30.4 miles.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of five members.

The domicile of the Board is at Pointe a la Hache, Plaquemines Parish, La.

The authorized bonded debt of the district, all of which is outstanding, is $30,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $194,755 and $188,700, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $3,834.55. During the years 1904 and 1905 collections amounting to the sum of $3,562.65 from the *ad valorem* or mill tax, and of $9,217.07 from the forced produce,

acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $19,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district, for this period, apparently some $31,779.72.

The amount and cost of the work done in the district during the past two years by the district, the State and the United States was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District				$ 1,961.36
By the State	1.16	2.61	78,142	9,373.19
By the United States		4.02	76,606	13,019.56
Totals	1.16	6.63	154,748	$24,354.11

In addition to the foregoing, the district expended $7,429.70 in revetments, minor repairs, for the care, preservation and protection of the levees in the district, and in protection work during high water.

The levees in the district have been very much improved in grade and section during the past two years, yet there remains considerable work to be done to bring them to a grade 3 feet above the highest water known, namely that of 1903, as recommended by the Board of State Engineers. This stage of water stood against these embankments nearly one foot higher than the highest previous water, which was that of 1897.

The 30.4 miles of levee in this district are also subjected to a greater strain from floods, which latterly occur at a much earlier and last for a longer period than was formerly the case; and, owing to prevailing winds and storms, as well as the wash of waves from the plying of large ocean steamers, which are yearly increasing in size, speed and number, have to be protected by wooden revetments at a considerable cost to the district. The

Levee Board has spent in the last two years about $5,000 in this character of work, placed in position under their own supervision and direction.

It is recognized by the Board of State Engineers that these levees, wherever exposed to these conditions, should be revetted, but it is suggested that the work should be done in a substantial, permanent and economical manner and under contract, in accordance with plans and specifications furnished by it, and executed under the supervision of the State Engineer in Charge.

The present line of levee should be extended to the lower limits of the district as soon as the necessary funds are available, closing Bayou Baptiste Collette Gap, an outlet of the Mississippi River, which, during floods, carries considerable sediment, deleteriously affecting the oyster bedding grounds in the rear, from which industry considerable revenue is derived by the district.

The cleaning of the levees of weeds, the drainage of borrow pits, and the restoring of wave-wash have been well done, but the supervision, care and maintenance of the levees as a whole have not received that full consideration which is demanded.

The Buras Levee District is composed of the alluvial lands subject to overflow on the right or west bank of the Mississippi River, "in the Parish of Plaquemines, south of a line drawn from the lower line of Riceland Plantation to the limits of Harang Canal on Bayou Lafourche," extending to the Jump.

The district is included in the United States Barataria District.

The levee line required and built in the district, fronting the Mississippi River, is 33.76 miles.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of five members.

The domicile of the Board is at Buras, Parish of Plaquemines, La.

The authorized bonded debt of the district, all of which is outstanding, is $35,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $490,018 and $518,710, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $10,087.28. During the years 1904 and 1905 collections amounting to the sum of $9,100.46 from the *ad valorem* or mill tax, and of $8,279.91 from the forced produce, acreage and railroad contributions, imposed by the district,

were made and paid into the State Treasury. Allotments aggregating some $18,000 from the General Engineer Fund were made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district, for this period, apparently some $35,380.37.

The amount and cost of the work done in the district during the past two years by the district, the State and the United States is as follows:

WORK DONE	Miles of New Levee Built	Miles of Levee Raised and Enlarged	Cubic Yards of Earthwork	COST
By the District				$ 1,953.83
By the State	0.96	2.83	84,796	13,060.71
By the United States	0.22	0.28	15,944	3,667.06
Totals	1.18	3.11	100,740	$18,681.60

In addition to the foregoing, the district has expended $13,836.40 in revetments, minor repairs and for the care, preservation and protection of the levees of the district.

The levees in the district have been very much improved in grade and section during the past two years, yet there remains considerable work to be done to bring them to a grade 3 feet above the highest water known—namely, that of 1903—as recommended by the Board of State Engineers. This stage of water stood against these embankments nearly one foot higher than the highest previous water, which was that of 1897.

The 34 miles of levee in this district are also subjected to a greater strain from floods, which latterly occur at a much earlier period and are of longer duration than was formerly the case; and, owing to prevailing winds and storms, as well as the wash of waves from the plying of large ocean steamers, yearly increasing in size, speed and number, have to be protected by revetments at a considerable cost to the district. The Levee Board has spent in the last two years about $10,000 in this character of work, placed in position under its own supervision and direction.

It is recognized by the Board of State Engineers that these

levees, wherever exposed to these conditions, should be revetted, but it is suggsted that the work should be done in a more substantial, permanent and economical manner than is usually in practice, and under contract, in accordance with plans and specifications furnished by it, and executed under the direction of the State Engineer in Charge.

The cleaning of the levees of weeds, the drainage of borrow pits, and the restoring of wave-wash have been well done, but the supervision, care and maintenance of the levees as a whole have not received that full consideration which is demanded.

The Plaquemines Parish East Bank Levee District, created by Act 7 of 1902, consists of "all the territory contained within the Parish of Plaquemines on the left or east bank of the Mississippi River, beginning at the upper line of Harlem Plantation and extending to the upper bank of Cuselich Canal, on the property of Peter Cuselich, below the Old Quarantine Station." It is entirely included within the limits of the Lake Borgne Basin Levee District and the Grand Prairie Levee District, so that all parts of it are also parts of another levee district. In this respect, as well as in having been constitued "for the purpose of protecting the lands of said district from inundation from the waters of the Gulf of Mexico," the Plaquemines Parish East Bank Levee District differs from any of the levee districts of the State previously created.

The length of levee line estimated to be required to accomplish the purposes of the act of the General Assembly of the State, under which the district is organized, is 33 miles.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of five members.

The domicile of the Board is at Pointe-a-la-Hache, Plaquemines Parish, La.

The authorized bonded debt of the district, all of which is outstanding, is $135,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $279,400 and $231,734, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $5,111.34. During the years 1904 and 1905 collections amounting to the sum of $2,471.22 from the *ad valorem* or mill tax, and of $14,047.47 from the forced produce, acreage and railroad contributions, imposed by the district, were

made and paid into the State Treasury. Allotments aggregating some $3.027.75 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district for this period, apparently some $19,546.44.

The amount and cost of the work done in the district during the past two years by the district and the State was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	7.61	------	126,889	$11,952.43
By the State	0.51	------	18,350	3,027.75
Totals	8.12	------	145,239	$14,980.18

In addition to the foregoing, the district expended $449.05 in weed cutting and minor repairs.

The only part of the system of levees proposed for this district so far completed is the cross levee along its upper boundary, from the Mississippi River front to the line of the proposed "Gulf Coast" Levee, constructed on a location immediately above and parallel to the upper line of Harlem Plantation.

The contracts in force for the work required in the district specify that the entire line included in the present project, amounting to some 980,000 cubic yards, shall be completed on or before January 1, 1908.

The Caddo Levee District. All alluvial land, and all lands subject to or liable to overflow from the waters of Red River, or its tributaries, or its outlets, situated in the Parish of Caddo, not including such lands as occur within the corporate limits of the City of Shreveport, are embraced within the boundaries of this district.

The continuous length of public levee upon which the district is now dependent for protection is as follows:

1. *Above Shreveport*—From Blanton's Bluff, Ark., to Gold Point, La., 45 miles. The length of river front between these limits is, however, about 54 miles.

2. *Below Shreveport*—From the bluffs on the north bank of Bayou Pierre to the lower line of Caddo Parish, about 35 miles, with a length of river front within these limits of about 42 miles.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of seven members.

The domicile of the Board is at Shreveport, La.

The authorized bonded debt of the district is $300,000. of which $299,800 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1904 and 1905 was $1,189,100 and $1,219,455, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $24,085.55. During the years 1904 and 1905 collections, including certain back taxes, amounting to the sum of $30,769.56 from the *ad valorem* or mill tax, and of $39,113.28 from the forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $67,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district for this period, apparently some $136,882.84.

The amount and cost of the levee work done in the district during the past two years by the district and the State is as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	2.40	.....	196,366	$25,836.55
By the State	6.45	.....	416,840	54,910.56
Totals	8.85	...	613,206	$80,747.11

In addition to the foregoing, the district has expended $253.83 in minor repairs, for the care, preservation and protection of the

levees of the district. And also $656.03 in protection work during high water.

The levees in the Caddo Levee District, both above and below Shreveport, are largely in excellent condition, and are well turfed with Bermuda grass, generally protecting them well from rain and wave-wash. The only exceptions are where new levees were constructed, and weeds have covered them before the Bermuda grass could spread, or where the sod has been killed or removed by rooting hogs or by constant wear and tear at paths, road and stock crossings. At many of these denuded places the levees have been washed down considerably and their section materially reduced. These are now the only apparent defects in an otherwise continuous and efficient levee system, showing a lack of regular inspection and policing of the levees in the district. Some more efficient system of supervision, care and maintenance than that now in vogue should be devised, or the abuses to which the levees are subjected will soon destroy their efficiency.

Considerable caving has occurred along the Caddo front during the past two years, as is evidenced by the number of new levees rendered necessary, and it appears that Red River is still in process of enlargement. It is perhaps too early to announce any material reduction of the flood level, due to the deepening of the river; but that such deepening and widening of the river are in process is very obvious. Especially is this true of that portion of the river below Shreveport, where the flood level during the freshet of June, 1905, was observed to be relatively from 1 to 2 1-2 feet lower than during the high waters of similar proportions of former years. The system above Shreveport has not been extended during the past two years from Pickett down to Twelve Mile Bayou, on the Cuba Place, a distance of about 4 miles, as previously recommended, chiefly for the reason that extensive caving along the front, already protected by levees, necessitated the expenditure of all available funds for the construction of new levees to replace the ones breached by caving banks. This extension is still recommended, and should be undertaken as soon as conditions and means permit.

As the territory below the Cuba Place is exempted from the operations of the act of incorporation of the Caddo Levee District, it is not probable that any extension of the system will be carried nearer towards Shreveport than Cuba Plantation, unless, at some time in the future, it be deemed wise and profitable to reincorporate it in the district.

The system below Shreveport already extends to the lower end of the parish, or the lower limit of the district. There is, however, a private levee, which joins the Caddo levee system and extends down into Red River Parish several miles, thus giving additional protection against back water flowing around the lower end of the levee system during high water. Below this point, for many miles, Red River seldom gets out of its banks, except during extreme floods and at natural outlets.

There is now a project on foot to levee the mouth of Grand Bayou and one or two low places just above, to close the only places through which water can escape except during extraordinary flood stages.

Red River Parish Sub-Levee District. Under the general provisions of Section 7 of Act No. 33 of 1879, relative to sub-levee districts, the State has recently, upon the recommendation of the Board of State Engineers, constructed a short line of embankment in this sub-levee district, containing 7,943 cubic yards, and costing $1,191.45.

This embankment is in the nature of a spur, built out from the main line of levee into a point known as Cottonwood Point, for the purpose of arresting the tendency of the point to develop into a cut-off.

This departure from the usual practices observed by the State was induced by the serious disturbances in the regimen of Red River within the past few years, resulting from the numerous cut-offs occurring along that part of its length, lying between the Caddo and Bossier Levee Districts, which precipitated the very aggravated caving of the banks of the river, and the consequent great loss of levee line on Red River, which has marked the period of this report.

The Bossier Levee District. All alluvial lands subject to or liable to overflow from the waters of Red River, or its tributaries or outlets in the Parish of Bossier, south of the line dividing the north half from the south half of township 20 north, are embraced within the boundaries of this district.

The public levee line protecting the district extends continuously from its upper limits, at the foot of Hurricane Bluff, to the Dennison Plantation, within 5 miles by river of the lower limits of the district, a length of line aggregating about 54 miles, the length of river front between the same limits being about 64 miles.

From the Dennison Plantation to the lower limits of the district the banks of Red River are, with two exceptions, somewhat higher than most of the high waters that have visited the river in the past, and hence have not yet been leveed continuously. The exceptions consist of two outlets of considerable proportions, departing from Red River in this stretch, Ninock Bayou and Swift Chute Bayou. Since the last report of the Board of State Engineers these outlets have been substantially leveed by the district, excluding the overflows from quite an extent of valuable territory which, in former years, backed up over it whenever Red River was in flood.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of seven members.

The domicile of the district is at Bossier City, La.

The authorized bonded debt of the district is $300,000, of which $249,900 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $1,507,124 and $1,806,394, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $33,135.18. During the years 1904 and 1905 collections amounting to the sum of $27,950.20 from the *ad valorem* or mill tax, and of $40,132.47 from the forced produce, acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $63,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district for this period, apparently some $131,082.67.

The amount and cost of the levee work done in the district during the past two years, by the district and the State, was as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	3.21	------	238,130	$35,410.11
By the State	4.75	0.11	357,945	53,723.44
Totals	7.96	0.11	596,075	$89,133.55

In addition to the foregoing, the district spent $4,133.05 in minor repairs and for the care, preservation and protection of its lines of levee. Also $5,753.33 in protection work during high water.

The levees in the Bossier Levee District are generally in good condition, although subjected to serious abuses at many places. Some of the levees are never pastured, and this allows the weeds to grow, while a few are used as public roads, much to their detriment. Hogs have also rooted the levees in a number of places. The greater part of the system is, however, properly grassed and pastured and presents a fine appearance. The pasturing of the levee and the batture at certain seasons of the year keeps down the weeds and rank growth, and is a desirable feature of levee maintenance, but in many places the proper inspection of the levee is rendered difficult, if not impracticable, by the abandonment of the public roads on the river front for shorter ones in the interior, usually next to and parallel with the railroads, followed by subsequent enclosure of the front roads and levee by a network of wire fences, through which it is impossible to pass, no gates or openings being provided. All of this is not only a hindrance to proper inspection, but contrary to law. What has been said in regard to lack of proper and regular inspection of the levees in the Caddo Levee District also applies to the levees in the Bossier Levee District.

A great deal of caving has occurred along the front of this district and many new levees were thereby rendered necessary.

Two cut-offs occurred during the high water of 1905—one at Southside, some 8 miles above Bossier City, and the other at Ninock, just below the lower end of the system now built. The great losses which have been caused to the levee lines of the Caddo and Bossier Levee Districts during the period covered by this report has, without doubt, in the opinion of the Board of State Engineers, been largely due to the numerous cut-offs which have occurred both above and below Shreveport, the effect of which has been to shorten the length of the river and increase the slope and velocity of current. (See letter in Appendix "B.")

No extension of the system has been made during the past two years, all available funds being absorbed in maintaining the line already constructed; so that there still remain about 5 miles, at the lower end of the district, unleveed, less two short lengths of levee which close Ninock and Swift Chute Bayous. As the river

seldom gets out of its banks along this part of its course, except during extreme floods, the extension is not urgent.

The Red River, Atchafalaya and Bayou Bœuf Levee District. All lands subject to overflow in the Parishes of Rapides and Avoyelles, and that part of the Parish of St. Landry situated between the Atchafalaya River on the east and Bayous Bœuf and Courtableau on the west and south, are subject to the operations of the original act of incorporation of this district.

All that section of Rapides Parish above Alexandria, bounded by Bayous Rapides, Jean de Jean and Red River, and all parts of the Parish of Avoyelles, situated on the left bank of Red River, as well as that part of the parish bounded by Bayou des Glaizes, the Atchafalaya and Red Rivers, and the public road running from David's Ferry, on Red River, to Bayou des Glaizes, by way of Marksville, Mansura and the "Long Bridge," at Bout du Bayou, have been exempted from the operations of the original act of incorporation of the district.

The continuous length of public levee upon which the district is now dependent for protection is as follows:

1. From the highlands of Bayou Rapides, about 1 1-2 miles above the mouth of the bayou, down the bayou to its junction with Red River, at Alexandria, about 1.5 miles; and thence down Red River to the Avoyelles Prairies, at David's Ferry; about 37 miles in length.

2. On the right bank of Bayou des Glaizes, from "The Junction," about 9 miles above Moreauville, down the bayou to its junction with the Atchafalaya River, at Simmsport, about 48 miles; and thence down the Atchafalaya River to a point about 7.5 miles below Melville, a length of about 34 miles, making a total of about 119 miles of levee.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of three members, one from each parish in the district.

The domicile of the Board is at Alexandria, La.

The authorized bonded debt of the district, all of which is outstanding, is $500,000.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $4,573,175 and $5,319,815, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $98,929.90. During the years 1904

and 1905 collections amounting to the sum of $87,689.13 from the *ad valorem* or mill tax, and of $58,338.70 from the forced acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury. Allotments aggregating some $45,000 from the General Engineer Fund were also made by the Board of State Engineers, making the total resources from taxation, forced contributions and allotments from the General Engineer Fund, for all purposes in the district for this period, apparently some $191,027.83.

The amount and cost of the work done in the district during the past two years by the district and the State is as follows:

WORK DONE	Miles of		Cubic Yards of Earthwork	COST
	New Levee Built	Levee Raised and Enlarged		
By the District	2.63	.....	210,446	$41,983.97
By the State	1.74	4.49	220,556	42,008.31
Totals	4.37	4.49	431,002	$83,992.28

In addition to the foregoing, the district expended $2,728.20 in minor repairs and for the care, preservation and protection of the levees and drainage channels of the district. Also $2,156.35 in bulkheads at the lower end of the system, on the Atchafalaya River, and in protection work during high water, as well as $69,274.68 for drainage work.

During the entire two years since the last report only one new levee has been rendered necessary by caving in the continuous line of levee in the district, namely, that at Hackney Place, about 20 miles below Alexandria, and even the work required at this point was of comparatively small extent. This district has been fortunate in experiencing but slight caving of the banks, and, as a consequence, its levee system is in excellent condition, save for such defects as are caused by abuses resulting in the wearing away of the sod from the levee, and subsequent rain-wash of the exposed parts. At some places the levee has been nearly cut in two by such abuses. However, these defects are few and are perhaps rendered glaring only by comparison with the otherwise excellency of the system.

What has been said in regard to the lack of proper and regular

inspection of the Caddo and Bossier Levee Districts must also be said of this district.

It is with pleasure that the Board of State Engineers records the fact that the system on Red River has been brought to a standard section for a distance of about 13 miles, from Alexandria south, making this part of the system practically safe against overflow, and that the continuation of this standardizing on down-stream at a fair rate seems assured.

During the past two years this district has completed the drainage system undertaken by it from Chatlin's Lake to Three Prong Lake, and from Three Prong Lake to Bayou des Glaizes, making a continuous system all the way from Alexandria to Bayou des Glaizes. The upper end of this drainage system has received quite efficient relief, although the rainfall has been unusually great, being much in excess of normal, but the efficiency of the lower end, only recently completed, is yet more or less affected by back water from the Mississippi River coming up the Atchafalaya River and Bayou des Glaizes.

The Red River, Atchafalaya and Bayou Bœuf Levee District has also completed the drainage work from Mill Bayou to Bayou Jack, *via* The Coulee, Choupique Lake, Turner's Bayou and the State Canal, now making a continuous channel from its head to Bayou Jack. As the levee line below Melville is extended southward, it is proposed to extend this drainage system also. Plans for extension are now being prepared. The levee line below Melville has been extended down stream during the past two years about 3.5 miles, and the work involved was still being vigorously prosecuted, under a State contract with the Board of Control of the State Penitentiary, when suspended by the rising river in February of this year. Some 8 miles of extension further down stream, to the mouth of Bayou Courtableau, the lower limits of the district on the Atchafalaya River, is contemplated.

The Red River and Bayou des Glaizes Levee and Drainage District. All lands in the Parish of Avoyelles, situated between Red River, the Atchafalaya River, Bayou des Glaizes, and the public road running from David's or Moncla's Ferry, on Red River, to Bayou des Glaizes, by way of Marksville, Mansura and the "Long Bridge," at Bout du Bayou, subject to overflow, are included in this district.

Operations in the district commenced actively only last season,

and, owing to quarantine restrictions, high water in Red River and exceptionally unfavorable weather, no completed line of levee yet exists. The proposed lines of levee, however, may be estimated to be ultimately about as follows: On Red River, about 70 miles; on the Atchafalaya River, about 5 miles; on Bayou des Glaizes, about 50 miles. Total, about 125 miles.

The affairs of the district are conducted by a Board of Levee Commissioners, consisting of three members.

The domicile of the Board is at Marksville, La.

The authorized bonded debt of the district is $300,000, of which $273,000 is, at this time, outstanding.

The assessed valuation of the district, on the tax rolls of 1904 and 1905, was $247,665 and $502,860, respectively.

The total possible amount of the *ad valorem* or mill tax collectible on these assessments was $7,505.25. During the years 1904 and 1905 collections amounting to the sum of $2,696.17 from the *ad valorem* or mill tax, and of $6,988.98 from the forced acreage and railroad contributions, imposed by the district, were made and paid into the State Treasury, making the total resources from taxation and forced contributions, for all purposes in the district for this period, apparently some $9,685.15.

The amount of work done in the district during the past two years was 332,418 cubic yards, costing $48,965.17.

Only about 12 1-2 miles of levee, in disconnected sections, have so far been completed in this district, but it is hoped to have the line continuous from the upper end of the district down to John Norman's Landing, a distance of about 16 miles, in the course of a few months. The work under contract will cover about 25 miles, and amounts to about 2,000,000 cubic yards.

The Courtableau Levee District is composed of an area of about 76 square miles in the Parish of St. Landry, south of Bayou Courtableau and east of the "back lines of grants on the Teche."

The district fronts on Bayou Courtableau and the Atchafalaya River, and, at the time of the organization of the Board of Levee Commissioners, consisting of three members, it was estimated by the Board of State Engineers that lines of levee would be required on these streams which would cost not less than $140,000. Therefore, in view of the limited area of the district, the small amount of revenue which it could, under the law, possibly supply, and the fact that, under any circumstances, high water in the

Atchafalaya River would pass around the lower end of the levee and overflow a considerable part of the district with "back water," it was wisely concluded by the Levee Commissioners, at a meeting on October 2, 1902, to take no immediate action for undertaking levee work. This action has not since been reconsidered.

The domicile of the Board is at Washington, La.

The authorized bonded debt of the district is $40,000.

The Mermentau Levee District covers an area of over 2,000 square miles, bordering on the Gulf of Mexico, and located partly in Calcasieu, Acadia, Vermillion and Cameron Parishes.

The aim and purpose of the district is to raise revenue for and undertake work to protect the lands of the district "from overflow or inflow of fresh or salt water."

The conduct of the affairs of the district is delegated to a Board of Levee Commissioners, consisting of seven members.

The domicile of the Board is at Crowley, Acadia Parish, La.

The authorized bonded debt of the district is $200,000.

Owing to local protests and legal complications, no plans for furthering the objects of the district have yet been formulated.

The geographical position of the levee districts of Louisiana and of Arkansas, where the levee lines of the latter, in localities, affect to a greater or less extent, dependent upon position and local conditions, the extent of overflow in certain parts of Louisiana, together with the approximate location and length of levee lines in each, and other information of a statistical character, is further illustrated in a map in Appendix "D."

Stages of the Rivers.

From the following table, showing the highest water of record, as well as the stages attained in 1904, 1905 and 1906, up to April 20, 1906, or the date of this report, at stations mostly governing conditions affecting Louisiana, it will be seen that the streams of the State have experienced no extreme flood stages since the date of the last report of this Board. Yet, while this is a fact, it must be borne in mind that stages were reached in all these streams during this period which, in former years, before the great improvement made in levee lines, would have subjected the State to serious inundation and loss of property, if not of life as well.

Table of highest water during the years 1904, 1905 and 1906 (the latter to April 20), compared with the highest of record at stations given:

LOCALITY	Highest Water of Record		High Water 1904		High Water 1905		High Water 1906 (to April 20)	
	Gauge Reading	Year	Gauge Reading	Below Highest Water.	Gauge Reading	Below Highest Water	Gauge Reading	Below Highest Water
MISSISSIPPI RIVER								
Arkansas City, Ark.	52.90	1903	49.00	3.90	43.00	9.90	49.70	3.20
Greenville, Miss.	49.10	1903	43.55	5.55	36.80	12.30	44.20	5.90
Lake Providence, La.	46.48	1903	42.50	3.98	36.40	10.08	43.00	3.48
Vicksburg, Miss.	52.48	1897	46.35	5.63	40.80	11.68	45.90	7.58
St. Joseph, La.	48.00	1903	42.75	5.25	37.40	10.60	42.10	5.90
Natchez, Miss.	50.35	1903	45.50	4.85	41.30	9.05	44.60	5.75
Red River Ldg., La.	50.20	1897	43.70	6.50	40.80	9.40	41.70	8.50
Baton Rouge, La.	40.65	1897	33.70	6.95	30.80	9.85	32.10	8.55
Donaldsonville, La.	32.75	1897	27.15	5.60	24.30	8.45	25.00	7.75
Carrollton, La.	19.42	1903	16.15	3.27	14.00	5.42	14.40	5.02
Ft. Jackson, La.	8.05	1903	7.20	0.85	6.50	1.55	6.50	1.55
RED RIVER								
Fulton, Ark.	35.75	1876	31.60	4.15	31.50	4.25	25.30	10.45
Shreveport, La.	35.70	1892	28.50	7.20	33.60	2.10	22.60	13.10
Alexandria, La.	38.25	1892	29.50	8.75	35.60	2.65	29.70	8.55
ATCHAFALAYA RIVER								
Barbres Ldg., La.	50.95	1897	41.25	9.75	40.20	10.75	40.05	10.90
Melville, La.	38.70	1903	34.30	4.40	34.10	4.65	34.20	4.50

In connection with the stages of the rivers since the date of the last report of the Board of State Engineers, a table will be found in Appendix "C," giving the "dates, gauge readings and elevations—Cairo Datum—of highest and lowest waters, during the years 1904, 1905 and 1906 (to April 20), compared with highest and lowest waters of previous records." From this it will be seen that no extremes of either high or of low water have occurred at any of the stations given during this period—rather remarkable facts.

In Appendix "C" will also be found a table giving "records of highest waters for stations and years indicated since 1871," which is an interesting and useful record.

It is a matter of congratulation to be able to record not only that no crevasses occurred in the State during the period of this report on any of the streams affecting it; but that, though somewhat higher stages will be attained during the course of the next ten days at all stations below Vicksburg, Miss., there are at this date —April 20, 1906—no indications of any flood this season sufficient to warrant alarm or anxiety.

Bayou Lafourche.

During the past two years the Bayou Lafourche improvement project, authorized by Legislative Acts of 1900 and 1902, was carried on with vigor.

The project involved the closure of Bayou Lafourche by a dike at Donaldsonville, the dredging of the bayou so as to maintain in it a depth of water of 6 feet, this water to be at all times fresh water, and, finally, the replacing of the dike by a lock, so as to admit navigation into the bayou from the Mississippi River at Donaldsonville.

The dike was completed prior to April 20, 1904. The high waters of 1904 and 1905, however, revealed that the land slope of this dike at high stages of the Mississippi River sloughed or crumbled down to a great and somewhat alarming extent. Borings made at the foot of the dike showed that a substratum of sand, more or less coarse, underlaid the dike and extended to a depth of at least 50 feet below its base. This sand, through which water flowed with more or less facility, according to whether it was coarse or fine, or whether the stage of the river was high or low, was the source of the trouble. At high stages of the river, the water flowing through this sand into Bayou Lafourche carried with it some of the sand, and the cavities made under the base of the dike by this displacement of material were filled by the land slope of the dike crumbling or sloughing in. During the high water of 1904 this sloughing was offset by adding earth to the river slope of the dike with a force of scrapers. Just prior to the high water of 1905 a row of sheet piling was driven under the land slope of the dike, with the hope of checking this movement of the sand particles. In addition to this a heavy banquette was added to the land slope of the dike.

During the low water season of 1905 this banquette was added to considerably. The high water stage of this year is not suffi-

ciently advanced to show the result of this treatment, but the indications are that it has proved efficient, as the sloughing or crumbling of the land slope at the present writing is very much less than it was for the same stage of the river in 1904 and 1905.

During the past two years the dredging of Bayou Lafourche was carried on vigorously, with the result that in February, 1906, very nearly all of the bars had been cut down, so as to give the required 6-foot depth of water over their crest. This work involved the dredging of some 699,000 cubic yards of earth.

Owing to the presence of quicksand in some portions of the bayou, especially near its head at Donaldsonville, and also owing to the washing of earth into the bayou from its banks by rainfall, to which must be added the earth carried into the bayou by the fresh water canals opened into it at various points, the 6-foot channel thus dredged has, in some places, been reduced to a lesser depth. To overcome this, the joint organization of the Atchafalaya Basin and Lafourche Levee Boards has deemed it wise to purchase a dredge with which to remove the bars thus formed, and to maintain the required 6 feet of water. As the work was in the nature of repair work, it was thought that it could be done more economically by the Levee Boards owning their own dredge.

The question of maintaining fresh water at all times in Bayou Lafourche has proved more vexatious. The summer and fall of 1904 having been exceedingly dry seasons, very little fresh water was supplied to the bayou by the Lake Bœuf Canal, which had been cut by the Board to connect Lake Bœuf with Bayou Lafourche, and by the Lake Fields, Company and Harang's Canals, which had been opened by private parties into the bayou with the authorization of the Levee Boards. Realizing that this condition of affairs might result in the appearance of salt water in Bayou Lafourche, the Levee Boards hastened to put in a plant of 5 18-inch siphons over the dike at Donaldsonville, so that water might be siphoned into the bayou when the stage of the Mississippi River permitted these siphons to operate. In addition to this, the Levee Boards constructed a floating pumping plant, with a capacity of 50,000,000 gallons per 24 hours, which was to be attached to these siphons at Donaldsonville and operated when the Mississippi River was below siphoning stage.

Besides this, at a point just above Harang's Canal, a dam was built across Bayou Lafourche, consisting of a double row of sheet piling, filled in between the rows with earth, through which an

opening 30 feet wide by 6 feet deep was left, which could be closed with pieces of 2x4 inch timber, or "needles," as they are termed. The object of this dam was to close the bayou against an inflow of salt water when the tide set in from the Gulf, and to allow the outflow of water from the bayou towards the Gulf, through the opening left in the dam, when the current set gulfward. This opening also allowed boats to pass through, so that the dam might be used as a check against salt water, but might not be an obstruction in any other sense.

The completion of the pumps and of the needle dam, however, was not accomplished until after the high Gulf tides, caused by the storms which prevail in the Gulf during the fall season, hence a large quantity of salt water found its way into Bayou Lafourche and interfered more or less with the operation of the sugar mills during the grinding season of 1904-5.

During the summer of 1905 a number of canals were opened by private parties into Bayou Lafourche for the purpose of supplying additional fresh water to that stream. These openings were only made after permission had been asked of the Executive Committee representing the joint organization of the Levee Boards, and this permission, which was generally granted, was usually accompanied by such safeguards as the Committee thought necessary to protect the interests intrusted to it by legislative enactments. Owing to the increased number of fresh water feeders and to the rainy fall of 1905, the water in Bayou Lafourche, during the grinding season of 1905-6, was absolutely fresh and no hardship was endured by the planters from this cause.

It is quite possible that the increased number of fresh water connections which have been allowed into Bayou Lafourche will be sufficient to prevent in the future the appearance of salt water in that stream. The Board of State Engineers has looked into this matter very thoroughly, and has recommended the connecting of Lake Verret with Bayou Lafourche and the removal of the pumping plant from the Mississippi River to the banks of a canal dug for the purpose of making such connection. This is fully treated in the report of this Board to the Executive Committee, dated June 2, 1905, which appears in Appendix "B."

The joint organization of the Atchafalaya Basin and Lafourche Levee Boards has been so occupied in carrying on the above described works that it has had little opportunity to undertake the construction of the locks at Donaldsonville, which will involve

the expenditure of at least some $350,000. In fact, it would appear that the residents along Bayou Lafourche are generally so pleased with the immunity from overflow which they enjoy from the building of the dam at Donaldsonville, that they no longer give any thought to the construction of the locks at Donaldsonville.

Bayou Lafourche is now connected by water with the Mississippi River, one route being through Harang's Canal, Lake Salvador, Company Canal and through the Company Canal Locks, situated about opposite Audubon Park, into the Mississippi River; and the other route being Barrows Canal, Lake Salvador and Harvey's Canal. The Harvey Canal Locks, opening into the Mississippi River, have not yet been completed, but will be opened this coming season, giving two all-water routes from Bayou Lafourche into the Mississippi River. A large tonnage, composed chiefly of vegetables, fish, oysters and general merchandise of all kinds, was transported between Bayou Lafourche and New Orleans through this route, and there is no reason why boats engaged in such trade should not come all the way up the bayou to Donaldsonville.

In addition to this all-water route, there are two lines of railroad paralleling Bayou Lafourche along the greater part of its length, one on each side. Besides this, barge lines ply up and down that stream, transferring their freight across the Donaldsonville Dike, by a mechanical transfer, to Mississippi River steamboats. Therefore, at the present writing, there appear to be ample transportation facilities for the products and supplies of that section of the country.

On the other hand, the Levee Boards have been saved the enormous sums which they used to spend annually on the Bayou Lafourche levees. They are at liberty to expend this money on their main line of levees on the Mississippi River, making it strong beyond the possibility of a break, and, therefore, protecting their territory from overflow.

The cutting off of Bayou Lafourche from the Mississippi River has also resulted in doing away with a large quantity of water which seeped through the levees and through the ground into the fields bordering this stream. As a result, the drainage of the lands adjoining the bayou has been vastly improved and large quantities of land have been reclaimed.

The project thus far has resulted in the greatest benefit to the population and to the lands adjoining the bayou, and, to our *mind*, these great benefits outweigh a hundredfold such inconve-

niences as may have been occasioned by the closure of the bayou.

The following extract, relative to Bayou Lafourche, and taken from the report of the Mississippi River Commission for 1905, summarizes the situation on that stream and gives the views of that body on the subject. The Board of State Engineers concurs in every respect therewith:

"Bayou Lafourche, a narrow outlet of the Mississippi, now closed by a temporary dam, flowed through the right bank of the river at Donaldsonville, 886 miles below Cairo, and after a course of 110 miles, emptied into the Gulf of Mexico. It derived its entire water supply from the Mississippi, the greatest measured discharge being about 32,000 cubic feet per second. It was only navigable by shallow-draft flatboats during seasons of low water, though, at high and medium stages, coal boats from the Mississippi River entered it and regular lines of steamboats carried on its commerce.

"Its banks are thickly peopled and highly cultivated, and levees on both sides for 70 miles or more down the bayou have been built and continually enlarged ever since the coming of the earlier settlers. But the levees have never proved adequate to control any of the larger floods, the normal condition at every high water in the Mississippi having always been that on one side or the other, or more often on both, the levees were overtopped and broken and disastrous overflow ensued.

"For this reason the closure of the bayou has been proposed and officially recommended time and again for the past fifty years, until finally authority was granted by Congress and the State Legislature to build a dam across the head of the bayou pending the construction of a lock, which the Levee Boards were authorized to build. They were also required to provide a channel 60 feet wide and 6 feet deep throughout the bayou.

"The dam was accordingly built during the winter of 1903-4, but, under the requirements of existing laws, must be removed on or before December 13, 1907.

"The dam is an earthen embankment similar to the dikes or levees crossing other bayous, and now forms a part of the levee system on the Mississippi River. No effect in raising the flood level of the Mississippi has been discovered, though it has closed the outlet during two flood seasons. So long as the dam remains it excludes all flood waters from the bayou, and thus prevents the danger of overflow from the failure of the bayou levees and

avoids the immense outlay formerly required in the attempt to maintain them, which official reports show to have been over $1,250,000 during the ten years preceding the closure of the bayou. The money formerly required for work on the Lafourche levees, and which would again be required were the dam removed, could be more effectively expended on the levees of the Mississippi.

"The Levee Boards have been prosecuting the work of dredging a 6-foot channel in the bayou ever since the building of the dam, and have found it a costly undertaking. They have not yet been able to begin the construction of a lock, and it appears evident that if now begun it could not be completed before the date prescribed by existing laws for the removal of the dam.

"It is, therefore, believed that, in the interest of protection from floods, the laws should be so amended as to permit the dam to remain, at least until the people who may be directly benefited by the resumption of navigation find it profitable to build a lock to again connect the bayou with the river."

New Basin Canal and Shell Road.

During the past two years the Board of Control of the New Basin Canal and Shell Road has continued the work of improving the State property in its care as rapidly as its means would permit.

The revetment of the west bank of the canal, between Magnolia Bridge and Carrollton Avenue, the only stretch remaining to be improved to complete the entire revetment of the west bank of the canal from Rampart Street to West End, has been completed. Besides this, considerable dredging in shallow places has been done, resulting in great improvement of navigation in the canal. All of the dredging done was with a view of giving a depth of 8 feet of water below mean Gulf level.

The Board has also projected the remodeling of the mouth of the canal into Lake Pontchartrain. This will probably involve the rebuilding of the western jetty and altering somewhat the eastern jetty. This work is quite necessary, and will result in greatly facilitating the entrance of vessels into the canal, especially during northwesterly gales.

The Board of State Engineers has been called in consultation in all of these works, and has prepared plans and specifications for these improvements, at the request of the Board of Control of the New Basin Canal and Shell Road.

The entrance of the Louisiana Railway and Navigation Company into the City of New Orleans is partly over State property, situated on the east bank of the New Basin Canal, between Carrollton Avenue and South Liberty Street. General safeguards, surrounding the granting of this privilege, were outlined by the Board of State Engineers at the request of Your Excellency, and are to be found in Appendix "B" of this report.

The Board of Control has requested the Board of State Engineers to establish the limits of the State property under its jurisdiction. Repeated attempts were made to locate with precision these boundaries, but it was found that all of the authentic records which might be of service in determining the exact lines have disappeared. Neither are they to be found in the archives of the City Engineer's Office. Under these circumstances, although several attempts have been made to survey the limits of this property, it has been impossible to obtain precise results. A number of surveyors engaged in private practice in the City of New Orleans claim to have in their possession records of old points and surveys, by which the exact boundary of the State property could be established. There is no way of obtaining these records from them, except by employing and paying them for their information and services in doing this work. The Board of Control has, therefore, authorized the Board of State Engineers to enter into such contract with private surveyors as would enable them to fix the boundaries of the State property with accuracy.

The numerous industries which are growing along the banks of the canal, and the various railroads which desire to cross the canal with bridges, besides the conduits and sewers which are crossing the State property under the bottom of the canal, render it necessary on the part of the Board of Control to investigate all grants and privileges requested of it with the utmost care, so that such grants might be surrounded by conditions safeguarding the interests of the State. To this end the Board of State Engineers has been called into frequent consultation with the Board of Control and has endeavored at all times to make such suggestions and recommendations in the granting of such privileges as would safeguard the interests of the State.

The Board of State Engineers desires to record its recognition of the earnestness and care with which the Board of Control has, at all times, managed the interests of the State property confided to its care, and to express its appreciation of the most pleasant relations existing between it and this most efficient body.

DRAINAGE.

The question of drainage is, at this time, as it undoubtedly should, attracting so much attention throughout the State of Louisiana, and the Board of State Engineers is so frequently in receipt of communications requesting information as to the provisions of law governing the organization of drainage districts and for advice as to the proper method of procedure in the premises, that it has been thought desirable to touch upon the subject in a general way in this report.

After protection from overflow, the most important step for Louisiana in the direction of development is unquestionably drainage. No State in the South presents evidence of the need of drainage more forcibly than Louisiana. Nor is any other State in the South more favored with the natural features and advantages for the inauguration and successful operation of comprehensive projects for drainage than Louisiana. Its importance as a factor in the preservation and maintenance of the lines of public levees, and its influence in agricultural and hygienic lines, cannot be overestimated. Nor should its bearing upon the success of the "good roads movement," already so wisely being agitated in many parts of the State, be forgotten.

In Article 281 of the Constitution of the State of Louisiana recognition of these facts are found, with authority to pass laws to put into operation such measures for improving drainage in the State as may be desired in localities. Article 281 reads as follows:

"ART. 281. Municipal corporations, parishes and drainage districts, the City of New Orleans excepted, when authorized to do so by a majority in the number and amount of the property taxpayers qualified as electors under the Constitution and laws of this State, voting at an election held for that purpose, after due notice of said election has been published for 30 days in the official journal of the municipality or parish, and, where there is no official journal, in a newspaper published therein, may incur debt and issue negotiable bonds therefor to the extent of one-tenth of the assessed valuation of the property within said municipal corporation, parish or drainage district, as shown by the last assessment made prior to the submission of the proposition to the property taxpayers voting at said election, to levy and assess special taxes upon the property subject to taxation in the parish, drainage district or corporation;

provided, said taxes so imposed do not exceed 5 mills on the dollar of the assessed valuation in any one year, nor run for a greater number of years than the number named in the proposition submitted to the taxpayers. No bonds shall be issued for any other purpose than stated in the submission of the proposition to the taxpayers, and published for 30 days, as aforesaid, nor for a greater amount than therein mentioned, nor shall such bonds be issued for any other purpose than for paving and improving streets, roads and alleys, purchasing or constructing a system of waterworks, sewerage, drainage, light, public parks and buildings, bridges and other works of public improvement, the title of which shall vest in the municipal corporation, parish or drainage district, as the case may be; nor shall such bonds run for a longer period than 40 years from their date, or bear a greater rate of interest than 5 per cent. per annum, or be sold by the municipal corporation, parish or drainage district issuing same for less than par.

"The municipal corporation, parish or drainage district issuing such bonds shall provide for the payment of the interest annually, or semi-annually, and the principal thereof at maturity; provided, that the total issue of bonds by any municipality, parish or drainage district for all purposes shall never exceed 10 per cent. of the assessed value of the property in such municipality, parish or drainage district; provided, that drainage districts availing themselves of the provisions of this ordinance shall be limited to the rate of taxation herein fixed, and such districts shall be prohibited from levying contributions under the provisions of existing laws; and provided, further, that nothing herein contained shall prevent drainage districts from being established under the provisions of existing laws."

Following this fundamental provision of law on the subject, the following Acts of the General Assembly of the State have been enacted, to-wit:

1. Act 5 of 1899, Extra Session of the General Assembly, carrying into effect Article 281 of the Constitution, authorizing municipal corporations, parishes and drainage districts, the City of New Orleans excepted, for purposes of works of public improvement, set forth in said article, to submit, under certain conditions, to the vote of the property taxpayers qualified to vote thereon, proposition to incur debt and issue negotiable bonds, and to levy and assess special taxes therefor, at a limited rate and for a limited time, etc.

2. Act 12 of 1900, amended and re-enacted by Act 159 of 1902, authorizing Police Juries to establish drainage districts and specifying the legal processes and safeguards to be observed in effecting organization and providing revenue.

3. Act 114 of 1900, authorizing municipal corporations, parishes and drainage districts, the City of New Orleans excepted, to incur debt, to issue negotiable bonds therefor, to levy special taxes and to provide the manner in which special elections shall be held in such parish, municipality or drainage district of the State for the purpose of incurring debt, issuing negotiable bonds therefor, and levying special taxes for paving and improving streets, roads and alleys, purchasing or constructing a system of waterworks, sewerage, drainage, light, public parks and buildings, bridges and other works of public improvement, the title to which shall vest in the municipal corporation, parish or drainage district, and to carry into effect Article 281 of the Constitution of 1898, and to repeal all laws contrary to or in conflict therewith.

4. Act 145 of 1902, amending and re-enacting Act 5 of 1899, Extra Session of the General Assembly, further providing the methods of petitioning for and giving notice of, and of holding elections on propositions submitted, of making the returns, of examining and canceling same, and of declaring and promulgating the result of elections, etc.

5. Act 211 of 1902, authorizing the Boards of Commissioners of drainage districts in the several parishes of the State which do not desire to avail themselves of the provisions of Article 281 of the Constitution of 1898, and the Acts of the General Assembly of the State of Louisiana, carrying into effect said article of the Constitution, to levy an annual contribution or acreage tax on the lands situated in such districts and to limit the rate thereof; to legalize and validate all elections held and debts incurred by such drainage districts under existing laws, and to prohibit the questioning of same.

6. Act 61 of 1904, for the protection of all public drainage canals or drainage channels in the State; investing the various levee and drainage districts of the State with control of all drainage channels within the limits of their district and for a space of 100 feet wide each side thereof, selected by any levee or drainage district and recommended and approved by the Board of State Engineers, whether such drainage channels have been improved by the levee or drainage district, or have been adopted without im-

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tenth of the assessed valuation of the drainage district, as represented on the assessments rolls in effect for the year previous to organization, and to an annual tax of 5 mills on the dollar on the annual assessed valuation of the drainage district for a stated period of years, to be named and ratified by election. Act 211 of 1902 provides for an annual contribution, not to exceed 50 cents per acre, in drainage districts where the Boards of Commissioner-do not desire to avail themselves of the provisions of Article 281 of the Constitution relative to revenues. Neither one of these, separately, provides revenue sufficient, at the inception of the work at all events, to place drainage districts on a proper financial basis. In other words, drainage districts may avail themselves of the provisions of one or the other of these methods of procedure, but not of both, the Constitution specifically prohibiting annual contributions to drainage districts availing themselves of the bonded indebtedness and special 5 mills tax. Were the provisions of both combined, intelligent effort might be encouraged. In other words, if Act 159 of 1902, carrying into effect Article 281 of the Constitution, provided, in addition, for a "forced contribution," not exceeding 50 cents per acre, as suggested in Act 211 of 1902, on the lines provided for in the case of the levee districts of the State, the position of drainage districts might be more assured. But as this is prohibited, it would appear that the only recourse is to amend Article 281 of the Constitution so as to permit more liberal provision for revenue.

It is safe to estimate that the assessed valuation of the average drainage district, so far considered, under existing laws does not exceed $500,000. Under the Constitution of the State and Act 159 of 1902, carrying into effect this provision, a bonded indebtedness of $50,000 and an annual special tax (gross) of $2,500 is, by election, permissible. As it is not practicable to assume a lower rate of interest on the bonds than 5 per cent. per annum, the special 5-mill tax thus at once becomes absorbed by this one item of expense, leaving no margin to cover cost of collection, administration of the affairs of the district, engineering and inspection work, preservation and maintenance of the drainage channels, and the retirement of bonds.

Again, it is not safe either to estimate the acreage of the average drainage district, so far discussed, at exceeding 50,000 acres, which at the maximum rate of 50 cents an acre, which it would no doubt, when left to the voice of the people, be difficult to impose, would

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States, in Louisiana and a part of Arkansas, from April 20, 1904, to April 20, 1906.

APPENDIX "B."—Copies of special reports, letters, etc., from the Board of State Engineers to Your Excellency, the various Levee Boards and Commissioners, Police Juries and to others interested in operations generally connected with the department.

APPENDIX "C."—Statements relative to high water records.

APPENDIX "D."—Map showing geographical position of the levee districts of Louisiana and of part of Arkansas, approximate location and lengths of levee lines in each, and other information of a statistical character.

APPENDIX "E."—List of acts of the General Assembly of the State of Louisiana from 1876 to 1906 and Articles of the Constitution of the State relative to levees, drainage, roads, etc., and the duties of the Board of State Engineers.

In conclusion the Board of State Engineers wishes to record its appreciation of the efficient and valuable services rendered by its corps of regular employees, Messrs. Walter H. Hoffman, secretary; A. C. Duval, chief draftsman; G. W. Lawes, assistant draftsman; A. Guibet, clerk, stenographer and typewriter; R. W. Richardson, J. J. Mundinger and W. B. Davey, levelers, and R. J. Smith, rodman.

Respectfully submitted,

The Board of State Engineers.

FRANK M. KERR,
Chief State Engineer.

SIDNEY F. LEWIS,
ARSENE PERRILLIAT,
MARSHALL P. ROBERTSON,
GERVAIS LOMBARD,
Assistant State Engineers.

WALTER H. HOFFMAN,
Secretary.

APPENDIX A.

TABULAR STATEMENTS RELATIVE TO LOCATION, LENGTH, QUANTITY AND COST OF LEVEE WORK UNDERTAKEN BY THE STATE OF LOUISIANA, THE SEVERAL BOARDS OF LEVEE COMMISSIONERS, AND THE UNITED STATES, IN LOUISIANA AND A PART OF ARKANSAS, FROM APRIL 20, 1904, TO APRIL 20, 1906.

Note.—The number of cubic yards given in the following statements for work done by the levee districts is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest or other incidental expenses incurred by the Levee Commissioners.

2. Act 12 of 1900, amended and re-enacted by Act 159 of 1902, authorizing Police Juries to establish drainage districts and specifying the legal processes and safeguards to be observed in effecting organization and providing revenue.

3. Act 114 of 1900, authorizing municipal corporations, parishes and drainage districts, the City of New Orleans excepted, to incur debt, to issue negotiable bonds therefor, to levy special taxes and to provide the manner in which special elections shall be held in such parish, municipality or drainage district of the State for the purpose of incurring debt, issuing negotiable bonds therefor, and levying special taxes for paving and improving streets, roads and alleys, purchasing or constructing a system of waterworks, sewerage, drainage, light, public parks and buildings, bridges and other works of public improvement, the title to which shall vest in the municipal corporation, parish or drainage district, and to carry into effect Article 281 of the Constitution of 1898, and to repeal all laws contrary to or in conflict therewith.

4. Act 145 of 1902, amending and re-enacting Act 5 of 1899, Extra Session of the General Assembly, further providing the methods of petitioning for and giving notice of, and of holding elections on propositions submitted, of making the returns, of examining and canceling same, and of declaring and promulgating the result of elections, etc.

5. Act 211 of 1902, authorizing the Boards of Commissioners of drainage districts in the several parishes of the State which do not desire to avail themselves of the provisions of Article 281 of the Constitution of 1898, and the Acts of the General Assembly of the State of Louisiana, carrying into effect said article of the Constitution, to levy an annual contribution or acreage tax on the lands situated in such districts and to limit the rate thereof; to legalize and validate all elections held and debts incurred by such drainage districts under existing laws, and to prohibit the questioning of same.

6. Act 61 of 1904, for the protection of all public drainage canals or drainage channels in the State; investing the various levee and drainage districts of the State with control of all drainage channels within the limits of their district and for a space of 100 feet wide each side thereof, selected by any levee or drainage district and recommended and approved by the Board of State Engineers, whether such drainage channels have been improved by the levee or drainage district, or have been adopted without im-

provement as necessary parts of or extensions to improved drainage channels; authorizing the said levee or drainage districts to adopt rules and regulations for preserving the efficiency of said drainage channels, and prescribing a penalty for the violation of such rules and regulations; forbidding the obstruction in any manner of such drainage channels except by authority and under the direction of said levee or drainage district; and making any violation of this act punishable by fine or imprisonment, or both, at the discretion of the Court.

Reviewing the laws on the subject, it will, therefore, be found that in general terms they provide that the Police Jury of a parish has power to divide the parish into drainage districts or fix the limits of any drainage district represented by petition to be desired by parties in interest; provided, that no such district shall contain, within its limits, less than five land owners; that a Board of Commissioners shall be appointed to conduct the affairs of the district and that, after the appointment of the Commissioners, the organization of the Board and an election properly held for the purpose, indebtedness, negotiable in bonds to the extent of one-tenth of the assessed valuation of the property in the drainage district, may be incurred to carry out the purposes of the act; that a special tax of 5 mills on the assessed valuation of the district may, by election, be imposed for a stated number of years; that, where Boards of Commissioners of Drainage Districts do not desire to avail themselves of the provisions of Article 281 of the Constitution and the Acts of the General Assembly carrying it into effect, an annual contribution or acreage tax, not to exceed 50 cents per acre, may, by election, be levied; and that the Boards of Commissioners are also given absolute jurisdiction over all drainage canals, and for a width of 100 feet each side of the said channel, whether they be channels improved by the drainage districts or unimproved natural watercourses forming links in any chain of drainage, selected by the Board of Commissioners and recommended and approved by the Board of State Engineers.

The law on the question seems, to the Board of State Engineers, to effectively pave the way to the accomplishment of the objects in view, except possibly in the matter of providing immediate adequate revenue.

Article 281 of the Constitution and Act 159 of the General Assembly of 1902 limit the possible revenues of drainage districts to an indebtedness, negotiable in bonds, to the extent of one-

tenth of the assessed valuation of the drainage district, as represented on the assessments rolls in effect for the year previous to organization, and to an annual tax of 5 mills on the dollar on the annual assessed valuation of the drainage district for a stated period of years, to be named and ratified by election. Act 211 of 1902 provides for an annual contribution, not to exceed 50 cents per acre, in drainage districts where the Boards of Commissioners do not desire to avail themselves of the provisions of Article 281 of the Constitution relative to revenues. Neither one of these, separately, provides revenue sufficient, at the inception of the work at all events, to place drainage districts on a proper financial basis. In other words, drainage districts may avail themselves of the provisions of one or the other of these methods of procedure, but not of both, the Constitution specifically prohibiting annual contributions to drainage districts availing themselves of the bonded indebtedness and special 5 mills tax. Were the provisions of both combined, intelligent effort might be encouraged. In other words, if Act 159 of 1902, carrying into effect Article 281 of the Constitution, provided, in addition, for a "forced contribution," not exceeding 50 cents per acre, as suggested in Act 211 of 1902, on the lines provided for in the case of the levee districts of the State, the position of drainage districts might be more assured. But as this is prohibited, it would appear that the only recourse is to amend Article 281 of the Constitution so as to permit more liberal provision for revenue.

It is safe to estimate that the assessed valuation of the average drainage district, so far considered, under existing laws does not exceed $500,000. Under the Constitution of the State and Act 159 of 1902, carrying into effect this provision, a bonded indebtedness of $50,000 and an annual special tax (gross) of $2,500 is, by election, permissible. As it is not practicable to assume a lower rate of interest on the bonds than 5 per cent. per annum, the special 5-mill tax thus at once becomes absorbed by this one item of expense, leaving no margin to cover cost of collection, administration of the affairs of the district, engineering and inspection work, preservation and maintenance of the drainage channels, and the retirement of bonds.

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States, in Louisiana and a part of Arkansas, from April 20, 1904, to April 20, 1906.

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Respectfully submitted,

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FRANK M. KERR,
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APPENDIX A.

TABULAR STATEMENTS RELATIVE TO LOCATION, LENGTH, QUANTITY AND COST OF LEVEE WORK UNDERTAKEN BY THE STATE OF LOUISIANA, THE SEVERAL BOARDS OF LEVEE COMMISSIONERS, AND THE UNITED STATES, IN LOUISIANA AND A PART OF ARKANSAS, FROM APRIL 20, 1904, TO APRIL 20, 1906.

Note.—The number of cubic yards given in the following statements for work done by the levee districts is based upon the list of dimensions furnished and estimates made by the Board of State Engineers for the levees named, and the cost is obtained by applying the price per cubic yard bid for the work, without regard to discount, interest or other incidental expenses incurred by the Levee Commissioners.

APPENDIX A. STATEMENT No. 1. STATE CONTRACTS.

Levee work undertaken by the State of Louisiana in the Several Levee Districts, under sixty-four contracts entered into from April 20, 1904, to April 20, 1906, with three contracts of earlier date, not completed April 20, 1904.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
	FIFTH LOUISIANA LEVEE DISTRICT.										
1	Cottonwood	E. Carroll	Oct. 5, '04	Apr. 7, '05		10,380	81,525	13¾	$ 11,311.59	Mississippi Riv.	
2	Cottonwood	E. Carroll	Nov. 21, '05		507	6,990	53,500	17.45	9,335.75	Mississippi Riv.	
3	Longwood	E. Carroll	Sept. 10, '03	July 18, '04		7,400	41,361	19.9	8,230.83	Mississippi Riv.	
4	Longwood	E. Carroll	Nov. 21, '05			7,170	48,500	15.45	7,493.25	Mississippi Riv.	
5	Longwood	E. Carroll	Oct. 5, '04	Mar. 24, '05		3,221	19,018	17.97	3,417.53	Mississippi Riv.	
	Elton Section					1,584	20,376		3,661.57		
	Spur Section					533	6,105		1,097.07		
6	Melville	E. Carroll	Jan. 10, '05	Nov. 7, '05		12,910	110,550	7.45	8,235.97	Mississippi Riv.	District paid $11,055 additional.
7	Martin	Madison	Mar. 11, '05	Mar. 29, '06	4,000		176,751	21	37,117.71	Mississippi Riv.	
8	Lake Palmyra Sec. No. 1	Tensas	Oct. 24, '05			16,400	107,500	14.75	15,856.25	Mississippi Riv.	
9	Lake Palmyra Sec. No. 2	Tensas	Oct. 24, '05			15,000	90,000	14.75	13,275.00	Mississippi Riv.	
10	Lake Palmyra Sec. No. 3	Tensas	Oct. 24, '05			13,000	65,200	14.75	9,617.00	Mississippi Riv.	
11	Evergreen-Bondurant	Tensas	Aug. 17, '04	May 30, '05		24,693	111,521	14.98	16,705.84	Mississippi Riv.	
12	Upper Green	Concordia	Aug. 17, '04	Feb. 21, '05	3,075		68,262	12.4	8,464.48	Mississippi Riv.	
13	Lower Green	Concordia	Aug. 17, '04	Apr. 26, '05	3,812		113,925	14.9	16,974.82	Mississippi Riv.	
14	Forest Home-Fishpond	Concordia	Aug. 17, '04	June 3, '05	10,675		246,089	13.7	33,714.19	Mississippi Riv.	
	Totals				23,269	119,281	1,360,193		$204,508.85		
	Less work done previous to Apr. 20, '04; not com'p'd. Apr. 20, '06				407	59,570	363,498		56,667.46		
	Work done from April 20, '04 to April 20, '06				22,862	59,711	996,695		$147,841.39		Average price 14.83 cents per cubic yard.
					or 4.33 mi.	or 11.31 mi.					

ATCHAFALAYA BASIN LEVEE DISTRICT.

15	Morganza	Pte. Coupee	Dec. 28, '05			5,750	122,000	38	$ 46,360.00	Mississippi Riv.	
16	Lakeland	Pte. Coupee	Jan. 14, '03	Dec. 5, '04		24,033	176,849			Mississippi Riv.	
	Irvine Section				2,266		55,775			Mississippi Riv.	
	Chapman Section				587	905	16,940			Mississippi Riv.	
	Taylor Section				927		16,731	14.95	58,243.55	Mississippi Riv.	
	Le Beau Section				1,113		22,703			Mississippi Riv.	
	Solouque Section					1,563	4,448			Mississippi Riv.	
	Pt. Pleasant					15,380	96,142			Mississippi Riv.	
17	Milam	Pte. Coupee	Sep. 20, '04	Dec. 19, '05	2,483	16,043	112,191	15.35	17,221.31	Atchafalaya Riv.	
	Totals				7,376	63,674	623,779		$121,824.86		
	Less work done previous	s to Apr. 20, '04; n	ot comp'd	Apr. 20, '06	3,780	26,886	363,041		82,395.62		
	Work done from April	20, '04, to Apr.	20, '06		3,596 or 0.68 mi.	36,788 or 6.97 mi.	260,738		$ 39,429.24		Average price 15.12 cents per cubic yard.
	The above is divided by	streams as foll	ows:								
			Miss iss i p	pi River	0.21 mi.	3.93 mi.	148,547		22,207.93		
			Atchafala	ya River	0.47 mi.	3.04 mi.	112,191		17,221.31		
			Totals		0.68 mi.	6.97 mi.	260,738		$ 39,429.24		

PONTCHARTRAIN LEVEE DISTRICT.

18	St. Rose-Nita	St. James	Oct. 5, '04	Mar. 26, '05	2,360	4,711	101,062	13.94	$14,088.04	Mississippi Riv.	
19	Celestin—	St. James	Aug. 17, '04	Dec. 2, '04	2,113		57,895	11.43	8,910.71	Mississippi Riv.	
	Lily Section					3,491	20,064				
20	Gypsy Point	St. Charles	Oct. 3, '05		6,568	11,312	182,710	13.95	25,488.04	Mississippi Riv.	
	Totals				11,041	19,514	361,731		$48,486.79		
	Less work not complet	ed April 20, 1906				1,300	15,790		2,202.70		
	Work done from April	20, 1904, to April	20, 1906		11,041 or 2.09 mi.	18,214 or 3.45 mi.	345,941		$46,284.09		Average price 13.38 cents per cubic yard.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
	LAFOURCHE BASIN LEVEE DISTRICT.										
1	Poor Devil Store	St. John	Nov. 21, '05	Jan. 27, '06	642		9,559	18	$ 1,720.62	Mississippi Riv.	
2	Whitney	St. John	Sept. 20, '04	Dec. 23, '04		1,355	12,005	18	2,160.90	Mississippi Riv.	
3	Jack Strange	St. John	Dec. 19, '05		2,800		95,000	18.95	18,002.50	Mississippi Riv.	
4	Four Oaks	Jefferson	Sept. 20, '04	Feb. 21, '05		4,030	14,914	19	2,833.66	Mississippi Riv.	
5	McDonoughville	Jefferson	Sept. 20, '04	Jan. 5, '05		5,565	16,110	21	3,383.10	Mississippi Riv.	
6	La Reusite	Plaquemines	Aug. 1, '05		5,115		69,988	16.74	11,715.99	Mississippi Riv.	
7	Deer Range to Pte. Celeste	Plaquemines	Sept. 20, '04	Apr. 7, '05	2,810	26,950	107,839	17	18,332.63	Mississippi Riv.	
	Totals				11,397	37,900	325,415		$58,149.40		
	Less work not completed April 20, 1906				7,945		164,988		29,718.49		
	Work done from April 20, 1904, to April 20, 1906				3,452 or 0.65 mi.	37,900 or 7.18 mi.	160,427		$28,430.91		Average price 17.72 cents per cubic yard.
	LAKE BORGNE BASIN LEVEE DISTRICT.										
28	Belair	Plaquemines	Sept. 20, '04	Mar. 21, '05	3,629		44,095	17.7	$ 7,804.81	Mississippi Riv.	
29	Hebert	Plaquemines	Oct. 10, '05	Feb. 5, '06	1,699		19,937	17¼	3,414.21	Mississippi Riv.	
30	St. Thomas Church	Plaquemines	Sept. 21, '04	Mar. 6, '05	2,852		25,302	16¾	4,238.08	Mississippi Riv.	
31	Martin	Plaquemines	Oct. 10, '05		1,968	686	30,797	17¼	5,273.98	Mississippi Riv.	
	Totals				10,158	686	120,131		$20,731.08		
	Less work not completed April 20, 1906				768	686	14,102		2,414.96		
	Work done from April 20, 1904, to April 20, 1906				9,390 or 1.77 mi.	000	106,029		$18,316.12		Average price 17.27 cents per cubic yard.

GRAND PRAIRIE LEVEE DISTRICT.

32	Waltzer to Nestor Canal	Plaquemines	Oct. 10, '05			11,155	40,085	15¾	$ 6,272.15	Mississippi Riv.	
33	Devils Flat	Plaquemines	Oct. 19, '04	Mar. 17, '05		7,057	31,275	14⅔	4,587.00	Mississippi Riv.	
34	Lucas Canal	Plaquemines	Jan. 26, '05	Apr. 14, '05	6,140		24,517	5.24	1,284.69	Mississippi Riv.	District paid $1,961.36 additional.
	Totals				6,140	18,212	95,827		$12,143.84		
	Less work not completed April 20, 1906					4,420	17,685		2,770.65		
	Work done from April 20, 1904, to April 20, 1906				6,140 or 1.16 mi.	13,792 or 2.61 mi.	78,142		$ 9,373.19		Average price 11.99 cents per cubic yard.

BURAS LEVEE DISTRICT.

35	Upper Buras	Plaquemines	Sep. 21, '04	Apr. 17, '06	1,712	3,944	27,858	18.	$ 3,621.54	Mississippi Riv.	
36	Orange Farm	Plaquemines	Oct. 10, '05		1,700		20,077	24.	4,818.48	Mississippi Riv.	
37	Gregory	Plaquemines	Oct. 10, '05		768		7,673	18.20	1,396.48	Mississippi Riv.	
	Buras Church	Plaquemines	Sep. 20, '04	Feb. 7, '05	1,856		17,296	14.9	2,577.10	Mississippi Riv.	
39	Reddick	Plaquemines	Oct. 24, '05	Mar 15, '06	615		4,951	16.99	841.17	Mississippi Riv.	
40	Lower Buras	Plaquemines	Sep. 20, '04	Feb. 7, '05		11,000	25,329	14.9	3,774.02	Mississippi Riv.	
	Totals				6,646	14,944	103,184		$17,028.79		
	Less work not completed April 20, 1906				1,563		18,388		3,968.08		
	Work done from April 20, 1904, to April 20, 1906				5,083 or 0.96 mi.	14,944 or 2.83 mi.	84,796		$13,060.71		Average price 15.40 cents per cubic yard.

PLAQUEMINES PARISH EAST BANK LEVEE DISTRICT.

41	Harlem Side	Plaquemines	May 3, '04	Sep. 22, '04	2,713 or 0.51 mi.		18,350	16.5	$3,027.75	Mississippi Riv.	Average price 16.5 cents per cubic yard

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
	CADDO LEVEE DISTRICT.										
42	Missionary	Caddo	Nov. 23, '05		5,264		67,700	13.4	$ 9,071.80	Red River	
43	Red Bayou	Caddo	Sept. 11, '05	Jan. 20, '06	1,960		41,370	16.94	7,008.07	Red River	
44	Gardner	Caddo	Aug. 17, '04	June 22, '05	3,100		47,135	10.2	4,807.77	Red River	
45	Gardner Extension	Caddo	May 22, '05	Sept. 4, '05	1,251		20,112	16	3,217.92	Red River	
46	Cedar Bluff	Caddo	Sept. 15, '05	Feb. 15, '06	2,987		38,611	13.9	5,366.93	Red River	
	Wood Place Section	Caddo			1,244		9,196	13.9	1,278.24	Red River	
47	Rush Point	Caddo	Sept. 12, '05	Dec. 1, '05	2,429		27,085	11.60	3,141.86	Red River	
48	Sterling Bayou	Caddo	Aug. 17, '04	May 5, '05	3,317		41,064	9.15	3,757.35	Red River	
49	Shreves Island	Caddo	Oct. 5, '05		4,871		42,700	11.30	4,825.10	Red River	
50	Long Branch	Caddo	Oct. 26, '05		2,842		36,900	14	5,166.00	Red River	
51	Long Point	Caddo	Oct. 19, '04	Mar. 24, '05	3,134		63,360	14.4	9,123.84	Red River	
52	Brown Place	Caddo	Nov. 23, '05		1,672		20,700	12	2,484.00	Red River	
53	Magnolia	Caddo	Oct. 19, '04	Mar. 31, '05	2,148		29,573	14.4	4,258.51	Red River	
54	Lower Cross Keys	Caddo	Oct. 19, '04	Mar. 31, '05	3,964		26,524	14.4	3,819.45	Red River	
	Totals				40,183		512,030		$67,326.84		
	Less work not completed April 20, 1906				6,118		95,190		12,416.28		
	Work done from April 20, 1904, to April 20, 1906				34,065 or 6.45 mi.		416,840		$54,910.56		Average price 13.17 cents per cubic yard.

BOSSIER LEVEE DISTRICT.

55	Willow Chute	Bossier	Aug. 12, '05	Dec. 11, '05	7 304		106,493	15.87	$16,900.43	Red River		
56	Colquitt Point	Bossier	Nov. 23, '05		2,934		29,662	11.4	3,381.46	Red River		
57	Jeter	Bossier	Oct. 22, '04	June 22, '05	3,408	600	49,739	13.9	6,913.72	Red River		
58	Belcher	Bossier	Nov. 23, '05	Feb. 5, '06	2,058		9,566	11.5	1,100.09	Red River		
59	Sunflower	Bossier	Aug. 17, '04	Jan. 23, '05	3,847		58,225	9.30	5,415.85	Red River		
60	Scopini	Bossier	Aug. 5, '05	Jan. 29, '06	4,035		86,335	19.75	17,051.16	Red River		
61	China Grove to Christiana	Bossier	Oct. 18, '05		3,277		41,846	14.11	5,904.47	Red River		
	Totals				26,863	600	381,876		$56,667.18			
	Less work not completed April 20, 1906				1,787		23,931		2,943.74			
	Work done from April 20, 1904, to April 20, 1906				25,076 or 4.75 mi.	600 or 0.11 mi.	357,945		$53,723.44			Average price 15 cents per cubic yard.

RED RIVER PARISH SUB-LEVEE DISTRICT.

62	Cotton Point Spur	Red River	Dec. 19, '05	Feb. 20, '06	2,692 or 0.51 mi.		7,943	15	$ 1,191.45	Red River		Average price 15 cents per cubic yard.

RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

63	Sandusky to Cummings Pt	Rapides	Oct. 19, '04	Oct. 17, '05		9,790	45,914	17¾	$ 7,920.16	Red River		
64	Cummings Pt	Rapides	Oct. 6, '05	Feb. 26, '06		9,172	43,187	21.4	9,242.01	Red River		
65	Jack Wilson—	Rapides	Aug. 5, '03	Jun. 20, '04		1,840	4,182	19.98	835.56	Red River		
	Hathorn Section					2,095	9,406		1,879.31			
	Beaubeouf					800	1,083		216.38			
66	Hackney	Rapides	Nov. 22, '05	Apr. 2, '06	2,329		23,245	14.	3,254.30	Red River		
67	Bayou Petite Prairie South	St. Landry	Aug. 16, '05		8,350		116,081	19.95	23,158.15	Atchafal'a River		
	Totals				10,679	23,697	243,098		$46,505.87			
	Less work not completed April 20, 1906				1,500		22,542		4,497.56			
	Work done from April 20, 1904, to April 20, 1906				9,179 or 1.74 mi.	23,697 or 4.49 mi.	220,556		$42,008.31			Average price 19.05 cents per cubic yard.
	The above is divided by streams as follows:											
			Red River		0.44 mi.	4.49 mi.	127,017		$23,347.72			
			Atchafalaya River		1.30 mi.		93,539		18,660.59			
			Totals		1.74 mi.	4.49 mi.	220,556		$42,008.31			

RECAPITULATION.

DISTRICT	Miles of New Levee	Miles of Enlargement	Cubic Yards	Price—Cents	COST	REMARKS
Fifth Louisiana Levee District	4.33	11.31	996,685	14.83	$147,841.39	
Atchafalaya Basin Levee District	0.68	6.97	260,738	15.12	39,429.24	
Ponchartrain Levee District	2.09	3.45	345,941	13.38	46,284.09	
Lafourche Basin Levee District	0.65	7.18	160,427	17.72	28,430.91	
Lake Borgne Basin Levee District	1.77	-------	106,029	17.27	18,316.12	
Grand Prairie Levee District	1.16	2.61	78,142	11.99	9,373.19	
Buras Levee District	0.96	2.83	84,796	15.40	13,060.71	
Plaquemines Parish East Bank Levee District	0.51	-------	18,350	16.5	3,027.75	
Caddo Levee District	6.45	-------	416,840	13.17	54,910.56	
Bossier Levee District	4.75	0.11	357,945	15.	53,723.44	
Red River Parish Sub-Levee District	0.51	-------	7,943	15.	1,191.45	
Red River, Atchafalaya and Bayou Bœuf Levee District	1.74	4.49	220,556	19.05	42,008.31	
Totals	25.60	38.95	3,054,392	-------	$457,597.16	Average price 14.98 cents per cubic yard.

APPENDIX A. STATEMENT No. 2. TENSAS BASIN LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Tensas Basin Levee District, under four contracts entered into from April 20, 1904, to April 20, 1906.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Gaines' Ldg. to Panther Forest	Chicot Co., Ark.	July 28, '04	Feb. 8, '05	.....	11,350	88,273	20	$17,654.60	Mississippi Riv.	
2	Carmichael	Chicot Co., Ark.	July 28, '04	Feb. 8, '05	.....	5,600	41,729	30	12,518.70	Mississippi Riv.	
3	Vaucluse to Sunny Side	Chicot Co., Ark.	June 20, '05	.....	.....	28,800	132,000	23.9	31,548.00	Mississippi Riv.	
4	Lake Port to Brook's Mill	Chicot Co., Ark.	June 20, '05	.....	.....	25,000	113,000	20.9	23,617.00	Mississippi Riv.	
	Totals					70,750	375,002	.....	$85,338.30		
	Less work not completed April 20, '06					34,300	155,700	.....	36,243.30		
	Work done from April 20, '04, to April 20, '06					36,450 or 6.90 mi.	219,302	.....	$49,095.00		Average price 22.38 cents per cubic yard.

APPENDIX A. STATEMENT No. 3. FIFTH LOUISIANA LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Fifth Louisiana Levee District, under thirteen contracts entered into from April 20, 1904, to April 20, 1906, with three contracts of earlier date not completed April 20, 1904.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Pilcher's Pt. Spur	East Carroll		Nov. 19, '04	338		5,959	16.	$ 953.44	Mississippi Riv.	
2	Bunches Bend	East Carroll	Aug. 12, '02	Oct. 26, '04		49,952	609,541	16.	97,526.56	Mississippi Riv.	
3	Donna Vista Enl'g'mt	East Carroll	Feb. 27, '04	Aug. 27, '04		3,110	21,230	14.5	3,078.35	Mississippi Riv.	
4	Donna Vista Wave W'h	East Carroll		Aug. 27, '04			5,520	14.5	800.40	Mississippi Riv	
5	Elton Banquette	East Carroll		May 7, '04		6,300	24,257	13.9	3,371.72	Mississippi Riv.	
6	Melville	East Carroll		(See State Contract)					11,055.00	Mississippi Riv.	
7	Willow Pt. Capping	East Carroll	Feb. 29, '04	Oct. 26, '04		21,300	40,510	25.	10,127.50	Mississippi Riv.	
8	Cabin Teele Enlg'm't	Madison	Jun. 20, '05			7,220	26,200	21.	5,502.00	Mississippi Riv.	
9	Reid Sloughing Repair	Madison					648	25.	162.00	Mississippi Riv.	
10	Hard Times Enl'gm't	Tensas	Jan. 2, '06			2,100	42,500	14.	5,950.00	Mississippi Riv.	
11	Evergreen, Bondurant	Tensas	Jun. 20, '05	Nov. 2, '05		13,874	29,575	32.	9,464.00	Mississippi Riv.	
12	Cottage Home	Tensas	July 4, '05			15,542	171,800	17.7	30,408.60	Mississippi Riv.	
13	Kempe	Tensas	Sep. 2, '04	Feb. 19, '06	5,767		361,256	26.	93,926.56	Mississippi Riv.	
14	Moro	Concordia	July 4, '05	Mar. 5, '06	5,295		83,182	13.	10,813.66	Mississippi Riv.	
15	Lower Concordia	Concordia	Oct. 5, '04	Jun. 22, '05	6,000		62,465	15.7	9,807.00	Mississippi Riv.	
16	Knox Pt. South	Concordia	July 4, '05	Apr. 16, '06	12,605		138,259	14.4	19,909.20	Mississippi Riv.	
	Totals				30,005	120,408	1,622,902		$312,856.08		
	Less work done previous to Apr. 20, '04; not comp'd			Apr. 20, '06		57,895	583,500		97,443.60		
	Work done from April 20, '04, to April 20, '06				30,005 or 5.68 mi.	62,513 or 11.84 mi.	1,039,402		$215,412.48		Average price 20.72 cents per cubic yard.

APPENDIX A. STATEMENT No. 4. ATCHAFALAYA BASIN LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Atchafalaya Basin Levee District, under two contracts entered into from April 20, 1904, to April 20, 1906, with two contracts of earlier date not completed April 20, 1904.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Dameron and White—		Jan. 12, '03	Mar. 20, '05				Scale		Mississippi Riv.	
	Kellar Banq. & Ditch					1,790	21,424				
	St. Matthew Ch. Banq.					680	2,045				
	Grand Bay Banquette					825	2,867				
	Missouri Enl'gm't					7,000	53,701				
	Eliza				4,162		208,720				
	Comeaux				990		24,776				
	Sardine Pt.				1,122		30,244				
	Sardine Pt.					2,200	13,734		$229,906.64		
	Sardine Pt.					5,983	39,465				
	St. Francis Church				3,884		117,061				
	Lefebvre				2,540		82,588				
	Plaquemines					23,775	178,081				
	Plaquemines, N. L.				250		11,060				
	Pt. Pleasant Enl'gm't					9,550	59,521				
	Bayou Goula				2,800		110,217				
	Texas				3,297		129,063				

Number	Name of Contract	Parish	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
2	Dameron & White, 1905-		Jan. 9, '05					Scale		Mississippi Riv.	
	Torras Cut						10,341				
	Australia Repair						1,188				
	Plaquemines					1,500	8,265				
	Plaquemines, N. L.				308		9,583				
	Plaquemines					198	1,330				
	Pt. Pleasant					6,042	38,843				
	Palo Alto to By. Goula					5,778	27,907		$96,558.89		
	Bayou Goula No. 2				1,685		48,600				
	Owen					9,685	71,748				
	Nodaway				900		24,745				
	Alhambra					16,557	110,116				
	Smoke Bend Lower				1,080		39,317				
	Smoke Bend Enl'gm't					8,363	25,704				
	Atchafalaya River, 1902	Pte. Coupee	Jan. 1, '02	Apr. 13, '05	52,466	28,675	829,872	19	157,675.08	Atchafalaya Riv.	
3	Atchafalaya River, 1904	Pte. Coupee	Jan. 9, '05			22,133	176,456	19	33,526.64	Atchafalaya Riv.	
	Totals				75,484	145,714	2,508,585		$507,662.85		
	Less work done previous	s to Apr. 20, '04; n	ot comp'd Apr. 20, '06		48,600	21,253	853,188		168,597.51		
	Work done from April	20, '04, to Apr.	20, '06		26,884 or 5.09 mi	124,461 or 23.57 mi	1,655,397		$339,065.34		Average price 20.48 cents per cubic yard.
	The above is divided by	streams as follo	ws:								
			Missi ss i p pi River		3.64 mi	14.72 mi	1,253,349		262,676 22		Average price 20.95 cents per cubic yard.
			Atchafala ya River		1.45 mi	8.83 mi	402,048		76,389.12		Average price 19 cents per cubic yard.
			Totals		5.09 mi	23.57 mi	1,655,397		$339,065.34		

APPENDIX A. STATEMENT No. 5. PONTCHARTRAIN LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Pontchartrain Levee District, under four contracts entered into from April 20, 1904, to April 20, 1906, with two contracts of earlier date not completed April 20, 1904.

Number	Name of Contract	Parish	DATE OF		LINEAR FEET		Cubic Yards	Price—Cents	Cost	Stream	REMARKS
			Contract	Final Certificate	New Levee	Enlargement					
1	Benkin	Iberville	Feb. 8, '04	Oct. 31, '04	.....	3,381	33,802	14.75	$ 4,985.80	Mississippi Riv.	
2	Hope to Terre Haute Wave Wash	St. John	.....	Nov. 25, '04	.....	9,200	.....	.....	519.80	Mississippi Riv.	
3	Elvina Enlg'm't	St. John	Oct. 12, '05	Dec. 15 '05	.....	1,000	3,367	18.	606.06	Mississippi Riv.	
4	Victoria	St. Charles	Oct. 6, '05	.....	.....	5,419	48,824	21.4	10,448.33	Mississippi Riv.	
5	Modoc—	St. Charles	Nov. 12, '04	.....	.....	6,900	37,684	12.75	6,978.32	Mississippi Riv.	
	Red Church Sect	.....	.....	.....	1,118	.....	17,048				
6	Perkins	Jefferson	Dec. 8, '03	Oct. 5, '04	2,514	20,900	147,310	17.95	26,442.14	Mississippi Riv.	
	Totals	.....	.....	.....	3,632	46,800	288,035	.....	$49,980.45		
	Less work done previous to Apr. 20, '04; not com'p'd			Apr. 20, '06	2,514	20,019	160,174	.....	30,435.66		
	Work done from Apr. 20, '04, to Apr. 20, '06			.....	1,118 or 0.21 mi.	26,781 or 5.07 mi.	127,861	.....	$19,544.79	.....	Average price 15.29 cents per cubic yard.

APPENDIX A. STATEMENT No. 6. LAFOURCHE BASIN LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Lafourche Basin Levee District under three contracts entered into from April 20, 1904, to April 20, 1906, with one contract of earlier date not completed April 20, 1904.

Number	Name of Contract	Parish	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Donaldsonville to Company Canal—										
	Hymelia Sect	St. Charles	Mar. 5, '04	Mar. 28, '05		2,825	9,278	scale	$ 1,709.08	Mississippi Riv.	
	Willswood	Jefferson	Jan. 12, '05	Mar. 13, '05		1,108	3,664	20	732.80	Mississippi Riv.	
3	Star	Plaquemines	Aug. 8, '05		417	10,050	45,464	22½	10,229.40	Mississippi Riv.	
4	Riceland	Plaquemines		Dec. 6, '04		3,387	10,711	15	1,606.65	Mississippi Riv.	
	Totals				417	18,270	69,117		$14,277.93		
	Less work not complete	d Apr. 20, '06				3,000	13,641		3,069.22		
	Work done from Apr. 2	0, '04, to Apr. 20,	'06		417 or 0.08 mi.	15,270 or 2.89 mi.	55,476		$11,208.71		Average price 20.20 cents per cubic yard.

APPENDIX A. STATEMENT No. 7. GRAND PRAIRIE LEVEE DISTRICT.

Amount contributed by the Board of Commissioners of the Grand Prairie Levee District towards the construction of the levee work named under a State contract entered into April 20, 1904, to April 20, 1906.

1	Lucas Canal	Plaquemines		(See State	Contract)			8	$1,961.36	Mississippi Riv.
	Total								$1,961.36	

APPENDIX A. STATEMENT No. 8. BURAS LEVEE DISTRICT.

Amounts contributed by the Board of Commissioners of the Buras Levee District toward the construction of the levee works named under three State contracts entered into from April 20, 1904, to April 20, 1906.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Upper Buras	Plaquemines	Sept. 19, '04	Apr. 17, '06	(See State	Contract)		3	$ 835.71	Mississippi Riv.	
2	Burns Church	Plaquemines	Sept. 19, '04	Feb. 7, '05	(See State	Contract)		5	864.80	Mississippi Riv.	
3	Lower Buras	Plaquemines	Sept. 19, '04	Feb. 7, '05	(See State	Contract)		1	253.29	Mississippi Riv.	
	Work paid for from April 20, '04, to April 20, '06								$1,953.83		

APPENDIX A. STATEMENT No. 9. PLAQUEMINES PARISH EAST BANK LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Plaquemines Parish East Bank Levee District under two contracts entered into from April 20, 1904, to April 20, 1906, and two contracts of earlier date not completed April 20, 1904.

1	Section 1, Gulf Coast	Plaquemines	Oct. 16, '02	Oct. 22, '04	65,525		257,700	9¾	$ 23,837.25	Gulf Coast.	
2	Section 2, Gulf Coast	Plaquemines	Oct. 16, '02	Nov. 9, '04	6,995		29,000	9¼	2,682.50	Gulf Coast.	
3	Section 3, Gulf Coast	Plaquemines	May 11, '05	Jan. 11, '06	3,357		13,344	11.20	1,494.52	Gulf Coast.	
4	Gulf Coast	Plaquemines	Jan. 5, '06		94,751	75,877	980,000	12.35 11.85	117,205.00	Gulf Coast.	
	Totals				170,628	75,877	1,280,044		$145,219.27		
	Less work done previous to Apr. 20, '04; not com'p'd			Apr. 20, '06	130,411	75,877	1,153,155		133,266.84		
	Work done from Apr. 20, '04, to Apr. 20, '06				40,217 or 7.61 mi.	000	126,889		$ 11,952.43		Average price 9.42 cents per cubic yard.

APPENDIX A. STATEMENT No. 10. CADDO LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Caddo Levee District under six contracts entered into from April 20, 1904, to April 20, 1906.

Number	Name of Contract	Parish	DATE OF Contract	DATE OF Final Certificate	LINEAR FEET New Levee	LINEAR FEET Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Levee Bend	Caddo	Nov. 10, '05	Jan. 29, '06	585	.....	2,401	8	$ 192.08	Red River	
2	Cocklebur Bayou	Caddo	Nov. 10, '05	Jan. 29, '06	445	.....	5,820	10	582.00	Red River	
3	Upper Dixie	Caddo	Apr. 26, '05	Sept. 2, '05	1,210	.....	26,118	16	4,178.88	Red River	
4	Dixie	Caddo	Sept. 22, '04	Feb. 17, '05	2,705	.....	49,890	11.9	5,935.72	Red River	
5	Riverdale	Caddo	Sept. 22, '04	Mar. 9, '05	3,987	.....	71,574	13.8	9,662.49	Red River	
6	Long Point	Caddo	Nov. 16, '05	Mar. 27, '06	3,736	.....	41,078	12.99	5,335.38	Red River	
	Work done from April 20, '04, to April 20, '06				12,648 or 2.40 mi	.....	196,300	.....	$25,836.55	.....	Average price 13.16 cents per cubic yard.

APPENDIX A. STATEMENT No. 11. BOSSIER LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Bossier Levee District under five contracts entered into from April 20, 1904, to April 20, 1906, and three contracts of earlier date not completed April 20, 1904.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	Cubic Yards	Price—Cents	Cost	Stream	REMARKS
1	Cash Pt.	Bossier	Aug. 4, '04	Oct. 19, '04	2,927		31,825	11.65	$ 3,707.61	Red River	
2	Gilmer Lane	Bossier	Aug. 4, '04	Dec. 19, '04	3,664		70,158	11.65	8,173.40	Red River	
3	Magenta	Bossier	Aug. 7, '05	Nov. 21, '05	4,185		61,902	16.7	10,337.63	Red River	
4	Gold Dust	Bossier	Aug. 7, '05	Jan. 20, '06	1,800		37,522	16.9	6,341.21	Red River	
5	Bear Point	Bossier	Nov. 29, '05		5,000		55,723	19.39	10,804.68	Red River	
6	Bear Point Spur	Bossier	Feb. 16, '04	May 30, '04	900		10,188	17.	1,731.96	Red River	
7	Ninock Bayou	Bossier	Feb. 16, '04	June 6, '04	1,263		17,154	18.	3,087.72	Red River	
8	Swift Chute Bayou	Bossier	Feb. 16, '04	May 30, '04	2,476		43,931	18.	7,907.58	Red River	
	Totals				22,305		328,403		$52,091.79		
	Less work done previous to Apr. 20, '04; not comp'd			Apr. 20, '06	5,320		90,273		16,681.68		
	Work done from Apr. 20, '04, to Apr. 20, '06				16,985 or 3.21 mi.		238,130		$35,410.11		Average price 14.87 cents per cubic yard.

APPENDIX A. STATEMENT No. 12. RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Red River, Atchafalaya and Bayou Boeuf Levee District under one contract entered into previous to April 20, 1904.

Bayou Petite Prairie South	St. Landry	July 16, '02		17,025		250,446	19.95	$49,963.97	Atchafalaya Riv.	
Less work done previous to April 20, '04				3,100		40,000		7,980.00		
Work done from April 20, '04, to April 20, '06				13,925 or 2.63 mi		210,446		$41,983.97		Average price 19.95 cents per cubic yard.

APPENDIX A. STATEMENT No. 13.

RED RIVER AND BAYOU DES GLAIZES LEVEE AND DRAINAGE DISTRICT.

Levee work undertaken by the Board of Commissioners of the Red River and Bayou des Glaizes Levee and Drainage District under one contract entered into from April 20, 1904, to April 20, 1906.

Name of Contract	Parish	DATE OF		LINEAR FEET		Cubic Yards	Price—Cents	Cost	Stream	REMARKS
		Contract	Final Certificate	New Levee	Enlargement					
David's Ferry South	Avoyelles	Oct. 10, '04		96,011		578,152	14.73	$85,161.78	Red River	
Work not completed A	pr. 20, '06			29,317		245,734		36,196.61		
Work done from Apr. 2	0, '04, to Apr. 20,	'06		66,694 or 12.63 mi.		332,418		$48,965.17		Average price 14.73 cents per cubic yard.

APPENDIX A. STATEMENT No. 14. RED RIVER, ATCHAFALAYA AND BAYOU BOEUF LEVEE DISTRICT.

Drainage work undertaken by the Board of Commissioners of the Red River, Atchafalaya and Bayou Boeuf Levee District under one contract entered into from April 20, 1904, to April 20, 1906, and two contracts of earlier date not completed April 20, 1904.

Name of Contract	Parish	DATE OF		MILES		Cubic Yards	Cost	Cost Clearing	Total Cost	REMARKS
		Contract	Final Certificate	Excavation	Clearing					
Three Prong Lake to Bayou Des Glaizes	Avoyelles	Feb. 7, '01	Jan. 3, '05	17.30	14.55	598,511	$50,448.43	$26,300.00	$ 76,348.43	
Turner's Bayou to Bayou Jack	Avoyelles and St. Landry	Feb. 7, '01	Mar. 18, '05	2.50	2.50	68,209	6,144.21	7,700.00	13,844.21	
Chatlin's Lake to Three Prong Lake	Rapides and Avoyelles	Feb. 25, '04	Dec. 11, '05	13.77	13.80	192,625	28,115.04	29,169.00	57,284.04	
Totals				33.57	30.94	854,405	$84,707.68	$63,169.00	$147,476.68	
Less work done previous to April 20, '04				17.30	16.15	578,000	49,130.00	29,072.00	78,202.00	
Work done from April 20, '04, to April 20, '06				16.27	14.79	276,405	$35,577.68	$34,097.00	$ 69,274.68	

APPENDIX A. STATEMENT No. 15. ATCHAFALAYA BASIN AND LAFOURCHE BASIN LEVEE DISTRICTS.

Work for improvement of Bayou Lafourche undertaken by the Boards of Commissioners of the Atchafalaya Basin and Lafourche Basin Levee Districts under two contracts entered into previous to April 20, 1904.

Name of Contract	Parish	Date of Contract	Date of Final Certificate	Feet—Dredging	Cubic Yards	Price—Cents	Cost	REMARKS
Lake Bœuf Canal	Lafourche	Oct. 10, '03	Aug. 30, '04	15,265	136,227	16	$ 21,796.32	
Bayou Lafourche, Dredging	Ascension, Assumption, Lafourche	Oct. 10, '03	Feb. 15, '06	196,628	698,950	16	111,832.00	
Totals				212,253	835,177		$133,628.32	
Less work done previous to April 20, '04				76,600	239,290		38,286.40	
Work done from April 20, '04, to April 20, '06				135,653 or 25.69 mi	595,887		$ 95,341.92	Average price 16 cents per cubic yard.

APPENDIX A. STATEMENT No. 16. ORLEANS LEVEE DISTRICT.

The Board of State Engineers is indebted to the Orleans Levee Board for the following statement of work undertaken by the Board of Commissioners under twelve contracts entered into from April 20, 1904, to April 20, 1906.

Number	Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet: New Levee	Linear Feet: Enlargem't	Linear Feet: Revetment	Linear Feet: Pile Bank Protection	Price per Cubic Yard of Earth	Price per 1000 Ft. B. M.	Price per Lin. Ft. of Piles	Number of Cubic Yards	Number of Feet B. M.	Number of Lin. Ft. of Piles	Total Cost	REMARKS
1	Orleans Outfall Levee	Orleans	July 29, '04	Nov. 17, '04		9,008			23¾c.			24,704.9			$ 5,899.43	$155 54 of this for small revetment.
2	Enlg'm't and Remodeling 2nd St. Levee		Oct. 19, '04	Nov. 27, '05		560			72¾c.			19,163.7			14,326.89	$385.30 of this for extras.
3	McLellanville Enlg'm't and Revetment		Oct. 18, '04	Jan. 10, '05		1,700	1,700		25c.	$30 00		3,154.1	71,409		2,930.85	
4	Raising and Enlg'm't of West End R. R. Embankment		Jan. 28, '05	Mar. 28, '06		12,057			35c.			11,325.4			3,963.89	
5	Filling in behind Tolouse St. Wharf		May 10, '05	Oct. 20, '05		850			35c.			4,624.8			1,618.69	
6	Raising and Enlg'm't New Basin Canal West Bank Claiborne to Carrollton Ave		May 30, '05	Sep. 7, '05		9,408			10c.			8,598.6			959.86	$100 of this for extras.
7	Furnishing of Piles and Caps for 3rd Dist. Canal		July 18, '05	Not Fin'd							20c.			57,050	9,128.00	$2,282 reserved.
8	Carondelet Enlg'm't and Revetm't		Dec. 21, '05	Mar. 24, '06		3,100	2,898		55c.	$34 75		3,049.5	135,266		6,421.46	$43.75 of this for extra labor.
9	Furnishing Lumber for Pile Bank Protection		Oct. 9, '05	Mar. 29, '06						$23 00			119,364		2,754.37	$9 of this for extra cartage.
10	Repairs to 3rd Dist. Pile Bank Protect'n		Oct. 3, '05	Not Fin'd						$14 00	11c.		107,520	38,835	4,645.15	$1161.29 reserved; $29.37 extra.
11	Hauling on New Basin		Verbal	Dec. 21, '05		1,500			35c.			509.7			178.40	
	Hauling to Levee and Barracks St.		Verbal	Dec. 21, '05		200			35c.			85.1			29.80	
	Filling on Commercial Front		Jan. 26, '05	Mar. 22, '05		680			40c.			2,556.7			1,022.70	
12	Totals					39,063	4,598					77,772.5	433,559	95,885	$53,879.49	

In addition to above $65,687.66 has been spent in the general maintenance and repair of levees.

RECAPITULATION.

DISTRICT	MILES New Levee	MILES Enlargement	Cubic Yards	Cost	Average Price—Cents			REMARKS
Tensas Basin Levee District		6.90	219,802	$ 49,005.00	22.28			
Fifth Louisiana Levee District	5.08	11.84	1,089,402	215,412.48	20.72			
Atchafalaya Basin Levee District	5.09	28.57	1,655,207	339,065.34	20.48			
Pontchartrain Levee District	0.21	5.07	127,861	19,544.79	15.29			
Lafourche Basin Levee District	0.08	2.89	55,476	11,208.71	20.20			
Grand Prairie Levee District				1,961.36				
Burns Levee District				1,958.88				
Plaquemines Parish East Bank Levee District	7.61		126,889	11,952.43	9.42			
Caddo Levee District	2.40		196,366	25,886.55	18.15			
Bossier Levee District	3.21		238,130	35,410.11	14.87			
Red River, Atchafalaya and Bayou Bœuf Levee District	2.68		210,446	41,983.97	19.95			
Red River and Bayou Des Glaizes Levee and Drainage District	12.63		332,418	48,965.17	14.73			
Orleans Levee District		7.39	77,778	30,858.49	39.68			
Totals	39.54	57.66	4,279,460	$882,743.26	19.45			

DRAINAGE	MILES Excavation	MILES Clearing	Excavation Cubic Yards	Excavation Cost		Cost Clearing	Total Cost
Red River, Atchafalaya and Bayou Bœuf Levee District	16.27	14.79	276,405	$95,577.68		$34,097.00	$129,274.68

IMPROVING BAYOU LAFOURCHE	MILES Excavation	Cubic Yards	Cost
Atchafalaya Basin and Lafourche Levee Districts	25.60	595,887	$95,341.92

APPENDIX A. STATEMENT No. 18. TOTALS AND BALANCES.

Showing the number of cubic yards and cost of levee work, under District and State contracts, in force April 20, 1904, and since entered into as follows, viz.: 1st, Total amounts involved; 2d, Amounts certified to April 20, 1906; 3d, Balances due April 20, 1906.

	Total Yardage and Cost Involved		Total Yardage and Cost Certified		Balance Due April 20, 1906		Remarks
	Cubic Yards	Cost	Cubic Yards	Cost	Cubic Yards	Cost	
		DISTRICT	WORK				
Tensas Basin	375,002	$ 85,338.30	219,302	$ 45,310.66	155,700	$ 40,027.64	
Fifth Louisiana	1,622,902	312,856.08	1,445,902	279,617.08	177,000	33,239.00	
Atchafalaya Basin	2,508,585	507,662.85	2,464,744	494,293.69	43,841	13,369.16	
Pontchartrain	288,045	49,980.45	238,211	38,257.12	49,824	11,723.33	
Lafourche Basin	69,117	14,277.93	45,953	8,062.53	23,164	6,215.40	
Grand Prairie		1,961.36		1,961.36			
Buras		1,953.83		1,953.83			
Plaquemines Parish East Bank	1,280,044	145,219.27	300,044	28,014.27	980,000	117,205.00	
Caddo	196,366	25,836.55	196,366	25,836.55			
Bossie	328,403	52,091.79	292,680	44,389.51	35,723	7,702.28	
Red River, Atchafalaya and Bayou Bœuf	250,446	49,963.97	250,446	49,963.97			
Red River and Bayou des Glaizes	2,000,000	294,600.00	332,000	39,122.88	1,668,000	255,477.12	
Totals	8,918,900	$1,541,742.38	5,785,648	$1,056,783.45	3,133,252	$484,958.93	
		STATE	WORK				
Fifth Louisiana	1,360,183	$ 204,508.85	1,034,685	$ 154,131.60	325,498	$ 50,377.25	
Atchafalaya Basin	623,779	121,824.86	501,779	75,464.86	122,000	46,360.00	
Pontchartrain	361,731	48,486.79	345,941	44,398.75	15,790	4,088.04	
Lafourche Basin	325,415	58,149.40	160,427	28,430.91	164,988	29,718.49	
Lake Borgne Basin	120,131	20,731.08	106,029	18,257.10	14,102	2,473.98	
Grand Prairie	95,827	12,143.84	78,142	8,671.69	17,685	3,472.15	
Buras	103,184	17,028.79	82,129	12,313.83	21,055	4,714.96	
Plaquemines Parish East Bank	18,350	3,027.75	18,350	3,027.75			
Caddo	512,030	67,326.84	416,790	52,979.94	95,240	14,346.90	
Bossier	381,876	56,667.18	357,945	52,281.25	23,931	4,385.93	
Red River Parish Sub	7,943	1,191.45	7,943	1,191.45			
Red River, Atchafalaya and Bayou Bœuf	243,098	46,505.87	220,556	41,487.27	22,542	5,018.60	
Totals	4,153,547	$ 657,592.70	3,330,716	$ 492,636.40	822,831	$164,956.30	
		SUMMARY					
Districts	8,918,900	$1,541,742.38	5,785,648	$1,056,783.45	3,133,252	$484,958.93	
State	4,153,547	657,592.70	3,330,716	492,636.40	822,831	164,956.30	
Totals	13,072,447	$2,199,335.08	9,116,364	$1,549,419.85	3,956,083	$649,915.23	

APPENDIX A. STATEMENT No. 19. UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Captain G. M. Hoffman, Corps of Engineers, Unted States Army, for the following statement of levees built and enlarged by the United States in the Upper Tensas District, in Arkansas and Louisiana, from April 20, 1904, to April 20, 1906:

Name of Contract	Parish	Date of Contract	Date of Final Certificate	Linear Feet New Levee	Linear Feet Enlargement	United States Cubic Yards	United States Price—Cents	United States Cost	Stream	REMARKS
In Arkansas										
0-500	Desha Co	Aug. 10, '04	Nov. 20, '05		50,000	239,427	15.	$ 35,914.05	Arkansas	
500-651	Desha Co	May 4, '04	Mar. 20, '05		15,100	108,371	17.74	19,225.02	Arkansas	
783-926	Desha Co	Aug. 10, '04		14,300		289,458	19.5	56,444.32	Arkansas	Not completed.
597-745	Desha Co	Aug. 10, '04	Mar. 6, '05		14,800	4,635	38.	1,761.30	Mississippi	
750-894	Desha Co	Jun. 26, '05	Dec. 12, '05		14,400	11,349	30.	3,404.70	Mississippi	
932-960	Desha Co	Jun. 26, '05	Nov. 3, '05		2,800	29,194	36.5	10,655.81	Mississippi	
960-1020	Desha Co	Jun. 26, '05	Dec. 26, '05		6,000	52,260	26.5	13,848.90	Mississippi	
1625-1720	Chicot Co	July 11, '05			9,500	59,359	27.9	16,561.16	Mississippi	Not completed.
1831-1870	Chicot Co	Jun. 26, '05	Aug. 2, '05		3,900	25,925	16.5	4,277.63	Mississippi	
2850-3100	Chicot Co	July 10, '05			25,000	117,562	19.5	22,924.59	Mississippi	
0-60 (Leland Spur)	Chicot Co	Jun. 24, '05	Mar. 6, '06		6,000	62,995	17.9	11,276.11	Mississippi	
2580-3744	Chicot Co	May 4, '04	Nov. 2, '05		116,400	46,410	20.	9,282.00	Mississippi	
3760-3950	Chicot Co	May 4, '04	Nov. 2, '05		19,000	124,947	20.	24,989.40	Mississippi	
Totals in Arkansas				14,300	282,900	1,171,892		$230,564.99		
In Louisiana—										
755-808	East Carroll	Jun. 22, '05	Nov. 8, '05		14,300	134,699	16.45 / 19.45	$ 23,759.30	Mississippi	
1589-1809	East Carroll	May 4, '04	Nov. 2, '05		27,000	159,640	18.5	29,533.40	Mississippi	
2110-2248	East Carroll	Aug. 10, '04	May 2, '05	13,300		318,092	15.9	50,576.62	Mississippi	
2960-3015	Madison	Aug. 10, '04	May 2, '05		15,500	31,199	15.9	4,960.64	Mississippi	
3335-3480	Madison	Aug. 10, '04	May 2, '05		14,500	17,963	15.9	2,856.11	Mississippi	
4450-4549	Madison	May 28, '04	Mar. 25, '05	9,000		489,567	24.6	120,433.48	Mississippi	
Totals in Louisiana				22,300	71,300	1,151,160		$231,969.55		

APPENDIX A. STATEMENT No. 20. UNITED STATES LEVEES.

The Board of State Engineers is indebted to the courtesy of Captain J. F. McIndoe, Corps of Engineers U. S. Army, for the following statement of levees built and enlarged by the United States in the Fourth District, improving Mississippi River from opposite Warrenton, Miss., to head of Passes, from April 20, 1904, to April 20, 1906.

LOWER TENSAS DISTRICT.

Name of Contract	Miles below Cairo	DATE OF Contract	DATE OF Completion	Length Linear Feet New Levee	Length Linear Feet Enlargement	Cubic Yards	Cost
White Lake, Lot 2							
Section 4	631 R	July 1, '03	July 24, '04	.....	800	12,617.80	$ 3,121.64
" 5	"	July 1, '03	July 24, '04	.....	800	12,973.96	3,209.76
Bougere, Lot 1							
Section 1	738 R	Aug. 13, '05	Nov. 15, '05	1,000	.....	16,267.33	3,489.34
" 2	"	Aug. 13, '05	Jan. 10, '06	700	.....	18,616.47	3,993.23
" 3	"	Aug. 13, '05	Feb. 7, '06	700	.....	19,526.34	4,188.40
" 4	"	Aug. 13, '05	Dec. 27, '05	800	.....	19,357.13	4,152.11
" 5	"	Aug. 13, '05	Jan. 10, '06	800	.....	21,045.34	4,514.23
" 6	"	Aug. 13, '05	Jan. 10, '06	500	.....	15,596.79	3,345.51
" 7	"	Aug. 13, '05	Jan. 31, '06	400	.....	14,400.90	3,089.00
" 8	"	Aug. 13, '05	Jan. 31, '06	400	.....	14,244.86	3,055.52
Bougere, Lot 2							
Section 1	739 R	Aug. 13, '05	Dec. 11, '05	500	.....	20,988.01	5,666.76
" 2	"	Aug. 13, '05	Feb. 8, '06	400	.....	18,773.60	5,068.87
" 3	"	Aug. 13, '05	Jan. 20, '06	500	.....	22,429.26	6,055.90
Bougere, Lot 8							
Section 7	742 5 R	Aug. 13, '05	Jan. 16, '06	900	.....	15,444.72	2,934.50
" 8	"	Aug. 13, '05	Dec. 27, '05	1,180	.....	14,685.61	2,790.27
Totals	.....	.....	.....	8,780	1,600	256,968.12	$58,675.04

ATCHAFALAYA DISTRICT.

Red River Landing	766 R						
Section 1	"	Dec. 11, '02	Apr. 12, '04	.....	1,105	13,151.02	$ 2,531.57
" 2	"	Dec. 11, '02	July 4, '04	.....	1,000	13,311.27	2,562.42
" 3	"	Dec. 11, '02	June 27, '04	.....	1,000	13,306.99	2,561.41
" 5	"	Dec. 11, '02	Sept. 19, '04	.....	1,100	12,769.41	2,458.11
" 6	"	Dec. 11, '02	Sept. 19, '04	.....	700	11,441.83	2,202.55
Hennette—							
Section 1	768 R	Apr. 1, '04	Oct. 6, '04	.....	1,300	12,383.69	2,414.82
" 2	"	Apr. 1, '04	Nov. 29, '04	.....	1,600	12,515.93	2,440.60
" 3	"	Apr. 1, '04	Nov. 29, '04	.....	1,400	12,683.54	2,473.29
" 4	"	Apr. 1, '04	Sept. 10, '04	.....	1,500	13,029.30	2,540.71
" 5	"	Apr. 1, '04	Sept. 20, '04	.....	1,300	12,500.61	2,437.62
" 6	"	Apr. 1, '04	Nov. 8, '04	.....	1,700	12,496.87	2,436.89
Latanache—							
Section 1	770 R	Apr. 1, '04	Oct. 10, '04	.....	2,000	13,268.78	2,056.66
" 2	"	Apr. 1, '04	June 9, '04	.....	2,200	13,361.48	2,071.02
" 3	"	Apr. 1, '04	June 29, '04	.....	2,200	13,695.24	2,122.76
New Texas—							
Section 1	786 R	Feb. 21, '04	Aug. 29, '04	.....	1,375	12,032.42	2,615.85
" 2	"	Feb. 21, '04	Aug. 29, '04	.....	1,400	12,220.89	2,656.82
" 3	"	Feb. 21, '04	Sept. 17, '04	.....	900	12,221.90	2,657.04
" 4	"	Feb. 21, '04	Sept. 17, '04	.....	900	12,848.42	2,793.24
" 5	"	Feb. 21, '04	Oct. 6, '04	.....	1,200	12,047.89	2,619 21
" 6	"	Feb. 21, '04	Oct. 7, '04	.....	1,600	11,602.20	2,522.32
" 7	"	Feb. 21, '04	Oct. 17, '04	.....	1,300	11,212.05	2,437.50
" 8	"	Feb. 21, '04	Oct. 19, '04	.....	1,493	12,253.37	2,663.88
Upper Morganza—							
Section 1	788 R	Nov. 8, '04	Mar. 6, '05	.....	1,555	13,581.34	2,963.26
" 2	"	Nov. 8, '04	Jan. 22, '05	.....	1,700	13,808.41	3,033.71
" 3	"	Nov. 8, '04	Nov. 30, '05	.....	1,200	14,274.73	3,136.16
" 4	"	Nov. 8, '04	Jan. 10, '05	.....	1,281	12,866.48	2,826.76
Pointe Coupee—							
Section 1	797 R	Nov. 8, '04	Apr. 14, '05	.....	2,550	14,759.08	2,937.06
" 2	"	Nov. 8, '04	Jan. 9, '06	.....	1,524	11,980.84	2,384.19
Totals	.....	.....	.....	.....	40,083	357,925.98	$71,587.[illegible]

APPENDIX A. STATEMENT No. 20—Continued.

Name of Contract	Miles below Cairo	Date of Contract	Date of Completion	Length Linear Feet: New Levee	Length Linear Feet: Enlargement	Cubic Yards	Cost
LAFOURCHE DISTRICT.							
St. James—							
Section 5	904.5 R	Dec. 3, '02	June 18, '04	.....	1,200	13,485.11	$ 1,955.34
" 6	"	Dec. 3, '02	June 18, '04	.....	1,450	13,554.65	1,965.42
Chopin—							
Section 1	906 R	Dec. 3, '02	Dec. 23, '04	.....	1,564	12,671.87	1,837.42
" 2	"	Dec. 3, '02	Dec. 8, '04	.....	1,644	12,508.88	1,813.79
Felicity—							
Section 1	909 R	June 29, '04	Aug. 30, '04	.....	1,423	12,368.87	1,484.27
" 2	"	June 29, '04	Aug. 31, '04	.....	1,800	12,660.20	1,519.22
" 3	"	June 29, '04	Aug. 31, '04	.....	1,900	12,763.43	1,531.61
" 4	"	June 29, '04	Sep. 26, '04	.....	2,500	12,537.81	1,504.54
" 5	"	June 29, '04	Sep. 26, '04	.....	2,000	12,916.10	1,549.93
Armont—							
Section 1	910 R	June 29, '04	Oct. 7, '04	.....	2,300	12,468.38	1,496.21
" 2	"	June 29, '04	Oct. 8, '04	.....	2,200	12,708.77	1,525.05
" 3	"	June 29, '04	Nov. 3, '04	.....	1,900	12,499.57	1,499.94
" 4	"	June 29, '04	Nov. 3, '04	.....	1,900	12,795.75	1,535.49
" 5	"	June 29, '04	Nov. 3, '04	.....	2,421	12,557.04	1,506.84
Gold Mine—							
Section 1	925.5 R	Dec. 19, '04	Mar. 29, '05	.....	1,956	9,314.09	1,114.90
" 2	"	Dec. 19, '04	Aug. 15, '05	1,041	.....	16,612.20	1,988.50
" 3	926 R	Dec. 19, '04	June 31, '05	.....	2,097	11,315.24	1,354.43
" 4	926.5 R	Dec. 19, '04	June 5, '05	.....	2,000	12,514.99	1,498.04
" 5	"	Dec. 19, '04	May 31, '05	.....	2,500	12,882.32	1,542.01
" 6	927 R	Dec. 19, '04	May 22, '05	.....	2,300	12,534.08	1,500.23
" 7	"	Dec. 19, '04	Apr. 24, '05	.....	2,100	12,832.28	1,536.02
Luling	940 R	June 29, '04	Mar. 10, '05	.....	2,800	14,087.15	2,390.50
Lone Star	941 R	June 29, '04	Oct. 18, '04	.....	3,223	14,160.86	2,403.10
Davis	942 R	June 29, '04	Feb. 13, '05	.....	2,711	13,731.53	2,330.24
Waguespack—							
Section 2	914 R	Jan. 10, '06	Feb. 20, '06	260	2,580	14,153.93	1,694.23
" 4	"	Jan. 10, '06	Mar. 13, '06	807	.....	14,496.24	1,735.20
Totals	.....	.....	.....	2,108	50,579	337,131.34	$43,812.66
BARATARIA DISTRICT.							
Alliance	998 R	Sep. 30, '04	Feb. 8, '05	3,042	.....	30,235.55	$ 5,260.98
Point Michel	1016 R	Sep. 30, '04	Jan. 3, '05	1,170	1,478	15,943.76	3,667.06
Woodland	1010 R	Oct. 10, '04	Mar. 10, '05	.....	8,053	40,726.97	7,530.42
Totals	.....	.....	.....	4,212	9,531	86,906.28	$16,458.46

APPENDIX A. STATEMENT No. 20—Continued.

Name of Contract	Miles below Cairo	DATE OF Contract	DATE OF Completion	Length Linear Feet New Levee	Length Linear Feet Enlargement	Cubic Yards	Cost
PONTCHARTRAIN DISTRICT.							
Ophelia—							
Section 1	866 L	June 29, '04	Sep. 8, '04	558	.....	13,688.12	$ 1,912.28
" 2	"	June 29, '04	Sep. 26, '04	500	.....	13,009.24	1,817.39
" 3	"	June 29, '04	Sep. 8, '04	600	.....	13,763.89	1,922.82
" 4	"	June 29, '04	Aug. 9, '04	600	.....	13,241.47	1,849.88
" 5	"	June 29, '04	Sep. 26, '04	600	.....	13,549.08	1,892.80
" 6	"	June 29, '04	July 25, '04	600	.....	13,413.49	1,873.87
" 7	"	June 29, '04	Aug. 9, '04	500	.....	11,643.42	1,626.58
" 8	"	June 29, '04	Sep. 8, '04	500	.....	12,603.49	1,760.70
" 9	"	June 29, '04	Sep. 20, '04	555	.....	12,914.51	1,804.16
" 10	"	June 29, '04	Aug. 15, '04	.....	892	10,577.19	1,477.63
" 11	"	June 29, '04	Aug. 15, '04	.....	665	9,006.04	1,258.42
Arizona—							
Section 1	873 L	Sep. 17, '04	Dec. 8, '04	.....	1,005	13,196.82	1,900.34
" 2	"	Sep. 17, '04	Dec. 8, '04	.....	900	12,596.32	1,813.87
" 3	"	Sep. 17, '04	Jan. 11, '05	.....	900	12,924.11	1,861.07
" 4	"	Sep. 17, '04	Dec. 20, '04	.....	800	12,428.27	1,789.67
" 5	"	Sep. 17, '04	Feb. 28, '05	.....	800	13,601.41	1,958.60
" 6	"	Sep. 17, '04	May 22, '05	.....	800	13,103.66	1,886.98
" 7	"	Sep. 17, '04	Mar. 20, '05	.....	1,100	14,084.41	2,021.95
Dreyfus—							
Section 1	875 L	Sep. 17, '04	Mar. 20, '05	.....	1,200	13,375.78	1,926.11
" 2	"	Sep. 17, '04	Mar. 30, '05	.....	1,000	13,230.63	1,905.21
" 3	"	Sep. 17, '04	Apr. 12, '05	.....	1,100	12,980.28	1,869.46
" 4	"	Sep. 17, '04	Apr. 14, '05	.....	1,200	13,008.23	1,873.49
" 5	"	Sep. 17, '04	Apr. 30, '05	.....	1,300	13,787.70	1,985.43
" 6	"	Sep. 17, '04	Apr. 30, '05	.....	1,300	13,319.09	1,917.95
" 7	"	Sep. 17, '04	May 31, '05	.....	1,192	12,501.28	1,800.18
Southwood—							
Section 1	877 L	Sep. 17, '04	Apr. 12, '05	.....	1,000	12,480.66	1,797.22
" 2	"	Sep. 17, '04	May 1, '05	.....	1,100	14,014.46	2,018.08
" 3	"	Sep. 17, '04	May 22, '05	.....	1,000	14,039.95	2,021.76
" 4	"	Sep. 17, '04	June 10, '05	.....	900	13,525.97	1,947.74
" 5	"	Sep. 17, '04	Aug. 10, '05	.....	900	13,970.30	2,011.72
" 6	"	Sep. 17, '04	Aug. 10, '05	.....	1,100	10,827.86	1,559.21
" 7	"	Sep. 17, '04	Mar. 30, '05	.....	954	11,522.54	1,659.95
Linwood—							
Section 1	877.5 L	Aug. 28, '05	Dec. 21, '05	.....	1,446	13,291.34	2,193.07
" 2	"	Aug. 28, '05	Dec. 21, '05	.....	1,500	13,580.35	2,240.76
" 3	"	Aug. 28, '05	Jan. 13, '06	.....	1,400	13,418.93	2,214.12
" 4	"	Aug. 28, '05	Jan. 24, '06	.....	1,200	13,107.62	2,162.76
" 5	"	Aug. 28, '05	Feb. 9, '06	.....	1,500	13,457.95	2,220.56
" 6	"	Aug. 28, '05	Mar. 21, '06	.....	1,500	12,917.57	2,131.49
LeBlanc—							
Section 1	884 L	Sept. 17, '04	Dec. 7, '04	.....	788	12,907.14	1,544.98
" 2	"	Sept. 17, '04	Dec. 7, '04	.....	900	12,049.90	1,442.37
" 3	"	Sept. 17, '04	Dec. 7, '04	.....	1,200	13,157.19	1,574.91
" 4	"	Sept. 17, '04	Dec. 7, '04	.....	1,200	12,128.36	1,451.76
" 5	"	Sept. 17, '04	Dec. 7, '04	400	400	12,669.29	1,516.51
Darrow—							
Section 1	886 L	Sept. 17, '04	Dec. 23, '04	400	.....	10,881.57	1,238.32
" 2	"	Sept. 17, '04	Dec. 23, '04	500	.....	13,371.13	1,521.63
" 3	"	Sept. 17, '04	Dec. 13, '04	373	174	11,091.24	1,262.18
" 4	"	Sept. 17, '04	Dec. 13, '04	.....	1,200	12,760.93	1,453.22
" 5	"	Sept. 17, '04	Dec. 23, '04	.....	1,495	12,431.52	1,414.71
Hermitage Upper—							
Section 4	877 L	Aug. 28, '05	Jan. 27, '06	.....	1,610	12,496.17	2,055.27
Hermitage—							
Section 1	888 L	Dec. 19, '04	Feb. 6, '05	.....	1,500	12,041.17	1,441.33
" 2	"	Dec. 19, '04	Feb. 3, '05	.....	1,300	12,179.92	1,457.93
" 3	"	Dec. 19, '04	Mar. 4, '05	.....	1,400	12,124.99	1,441.36
" 4	"	Dec. 19, '04	Mar. 4, '05	.....	1,700	12,160.03	1,455.56
" 5	"	Dec. 19, '04	Mar. 4, '05	.....	1,500	11,918.34	1,416.62
" 6	"	Dec. 19, '04	Mar. 4, '05	.....	1,471	12,065.11	1,516.03
Marchand—							
Section 1	889 L	Sept. 17, '04	Feb. 26, '05	.....	1,163	11,579.02	1,360.53
" 2	"	Sept. 17, '04	Feb. 26, '05	.....	1,300	12,503.18	1,469.42
" 3	"	Sept. 17, '04	Feb. 26, '05	.....	978	11,412.95	1,341.32

APPENDIX A. STATEMENT No. 20—Continued.

Name of Contract	Miles below Cario	DATE OF Contract	DATE OF Completion	Length Linear Feet New Levee	Length Linear Feet Enlargement	Cubic Yards	Cost
PONTCHARTRAIN DISTRICT.—Continued.							
Lambert—							
Section 1	906 L	June 29, '04	Sept. 20, '04	.....	1,300	11,640.32	$ 1,626.15
" 2	"	June 29, '04	Sept. 20, '04	.....	1,300	11,913.91	1,664.37
" 3	"	June 29, '04	Sept. 23, '04	.....	1,200	11,762.05	1,643.16
" 4	"	June 29, '04	Sept. 23, '04	.....	1,300	12,004.71	1,677.06
" 5	"	June 29, '04	Oct. 20, '04	.....	1,500	11,428.30	1,596.58
" 6	"	June 29, '04	Nov. 29, '04	.....	1,500	11,376.89	1,589.28
" 7	"	June 29, '04	Nov. 28, '04	.....	1,400	11,876.12	1,659.09
Oneida—							
Section 1	907 L	June 29, '04	Dec. 7, '04	.....	1,000	11,384.48	1,583.42
" 2	"	June 29, '04	Jan. 18, '05	.....	1,000	12,274.52	1,714.75
" 3	"	June 29, '04	Mar. 21, '05	.....	1,200	12,153.08	1,697.78
" 4	"	June 29, '04	Mar. 25, '05	.....	1,600	11,451.40	1,599.76
" 5	"	June 29, '04	Apr. 11, '05	.....	1,398	11,111.87	1,552.26
" 6	"	June 29, '04	Apr. 18, '05	.....	1,526	12,005.78	1,677.56
" 7	"	June 29, '04	Jan. 31, '05	.....	1,407	12,207.05	1,705.33
Belmont—							
Section 1	908 L	Feb. 24, '03	Dec. 29, '05	.....	1,300	14,373.11	2,651.34
" 2	"	Feb. 24, '03	Dec. 4, '05	.....	1,200	13,836.75	2,552.88
" 3	"	Feb. 24, '03	Oct. 31, '05	.....	1,100	14,321.07	2,642.24
Hester—							
Section 1	909 L	Feb. 24, '03	Sept. 23, '05	.....	1,000	11,951.08	2,204.97
" 2	"	Feb. 24, '03	Sept. 5, '05	.....	1,100	13,070.36	2,411.48
" 4	"	Feb. 24, '03	Feb. 16, '05	.....	1,400	11,719.96	2,162.33
Lutcher—							
Section 1	915 L	Aug. 28, '05	Feb. 5, '06	.....	1,618	13,157.69	2,171.02
" 2	"	Aug. 28, '05	Mar. 21, '06	.....	2,347	16,286.18	2,687.21
Angelina—							
Section 1	917 L	Feb. 24, '03	Nov. 1, '04	.....	894	10,015.80	2,490.95
" 2	"	Feb. 24, '03	Nov. 21, '04	.....	900	9,294.46	2,296.61
" 3	"	Feb. 24, '03	Dec. 7, '04	.....	835	9,296.51	2,312.04
Reserve—							
Section 1	922 L	Jan. 19, '04	July 13, '04	.....	1,607	13,670.09	1,770.28
" 2	"	Jan. 19, '04	July 25, '04	.....	1,900	13,157.37	1,742.73
" 3	"	Jan. 19, '04	Aug. 1, '04	.....	1,500	12,293.00	1,673.53
" 4	"	Jan. 19, '04	Aug. 19, '04	.....	1,000	13,281.53	1,719.96
" 5	"	Jan. 19, '04	Aug. 29, '04	.....	1,300	13,995.74	1,812.45
Cornland—							
Section 1	923.5 L	Jan. 19, '04	Sept. 8, '04	.....	1,700	13,107.38	1,697.41
" 2	"	Jan. 19, '04	Sept. 19, '04	.....	1,900	13,563.64	1,756.49
" 3	"	Jan. 19, '04	Sept. 29, '04	.....	2,000	13,411.21	1,736.75
" 4	"	Jan. 19, '04	Oct. 8, '04	.....	1,600	13,418.76	1,737.72
" 5	"	Jan. 19, '04	Oct. 25, '04	.....	1,400	12,382.27	1,603.50
Belle Point—							
Section 1	925 L	Jan. 19, '04	Nov. 3, '04	.....	1,400	13,852.65	1,835.47
" 2	"	Jan. 19, '04	Nov. 14, '04	.....	1,700	13,708.29	1,816.35
" 3	"	Jan. 19, '04	Nov. 19, '04	.....	2,100	12,903.01	1,709.65
" 4	"	Jan. 19, '04	Nov. 28, '04	.....	2,100	14,248.34	1,887.91
" 5	"	Jan. 19, '04	Dec. 3, '04	.....	1,803	14,869.28	1,970.18
Good Hope—							
Section 1	935 L	June 29, '04	Sept. 1, '04	.....	1,804	11,540.48	1,497.95
" 2	"	June 29, '04	Sept. 1, '04	.....	2,088	11,933.34	1,548.95
Totals	.....	.....	.....	6,086	114,860	1,293,692.46	$180,348.14
LAKE BORGNE DISTRICT.							
Burton to Lauderbogh	1022 L	Sept. 15, '04	Dec. 24, '04	.....	6,480	27,263.10	$ 4,684.73
Harris to Pt. Pleasant	1027 L	Sept. 15, '04	Dec. 20, '04	.....	10,741	34,239.85	5,364.25
Vogt	1024 L	Oct. 10, '04	Mar. 2, '05	.....	4,022	15,102.89	3,020.58
Totals	.....	.....	.....	.....	21,243	76,605.84	$13,019.56

APPENDIX A. STATEMENT No. 21. UNITED STATES LEVEES.

RECAPITULATION.

	MILES			
	New Levee	Enlargement	Cubic Yards	Cost
Upper Tensas in Arkansas	2.70	53.58	1,171,892.00	$230,564.99
Upper Tensas in Louisiana { Fifth Louisiana Levee Dist. }	4.22	13.50	1,151,160.00	231,989.55
Lower Tensas { Fifth Louisiana Levee Dist. }	1.65	0.30	256,968.12	58,675.04
Atchafalaya Basin		7.59	357,625.98	71,587.43
Pontchartrain Levee District	1.26	21.75	1,263,692.46	180,348.14
Lafourche Levee District	0.97	11.10	408,093.86	56,604.06
Lake Borgne Basin Levee District				
Grand Prairie Levee District		4.02	76,605.84	13,019.56
Buras Levee District	0.22	0.28	15,943.76	3,667.06
Totals	11.03	112.12	4,701,982.02	$846,405.83

APPENDIX A. STATEMENT No. 22. **SUMMARY ACCORDING TO DISTRICTS.**

Approximate quantities and cost of levee work in the several levee districts of Louisiana and in Desha and Chicot Counties, Arkansas, from April 20, 1904, to April 20, 1906, by the Districts, State and United States as shown in the foregoing statements.

Name of District	By Whom Done	MILES		Cubic Yards	Cost	Average Price—Cents
		New Levee	Enlargement			
Arkansas	Tensas Basin Levee District		6.90	219,302	$ 49,095.00	22.38
	United States	2.70	53.58	1,171,892	230,564.99	
Totals		2.70	60.48	1,391,194	$279,659.99	
In Louisiana— Fifth Louisiana Levee District	District	5.68	11.84	1,039,402	$215,412.48	20.72
	State	4.33	11.31	996,685	147,841.39	14.83
	United States—Upper Tensas	4.22	13.50	1,151,160	231,989.55	
	United States—Lower Tensas	1.66	0.30	256,968.12	58,675.04	
Totals		15.89	36.95	3,444,215.12	$653,868.46	
Atchafalaya Basin Levee District	District	5.09	23.57	1,655,397	$239,065.34	20.48
	State	0.68	6.97	260,738	39,429.24	15.12
	United States		7.59	357,625.98	71,587.43	
Totals		5.77	38.13	2,273,760.98	$450,082.01	
Pontchartrain Levee District	District	0.21	5.07	127,861	$ 19,544.79	15.29
	State	2.09	3.45	345,941	46,284.09	13.38
	United States	1.26	21.75	1,263,692.46	180,348.14	
Totals		3.56	30.27	1,737,494.46	$246,177.02	

Lafourche Basin Levee District	District	0.08	2.89	55,476	$11,208.71	20.20
	State	0.65	7.18	160,427	28,430.91	17.72
	United States	0.97	11.10	408,093.86	56,604.06	.....
Totals		1.70	21.17	623,996.86	$96,243.68	
Orleans Levee District	District	.....	7.39	77,773	$30,358.49	39.03
Totals		.....	7.39	77,773	$30,358.49	
Lake Borgne Basin Levee District	State	1.77	.....	106,029	$18,316.12	17.27
	United States	.....	.....	.....	.....	.....
Totals		1.77	.....	106,029	$18,316.12	
Grand Prairie Levee District	District	.....	.....	.....	$ 1,961.36	.....
	State	1.16	2.61	78,142	9,373.19	11.99
	United States	.....	4.02	76,605.84	$13,019.56	.....
Totals		1.16	6.63	154,747.84	$24,354.11	
Buras Levee District	District	.....	.....	.....	$ 1,958.83	.....
	State	0.96	2.83	84,796	13,060.71	15.40
	United States	0.22	0.28	15,943.76	3,667.06	.....
Totals		1.18	3.11	100,739.76	$18,681.60	
Plaquemines Parish East Bank Levee District	District	7.61	.....	126,889	$11,952.43	9.42
	State	0.51	.....	18,350	3,027.75	16.50
Totals		8.12	.....	145,239	$14,980.18	
Caddo Levee District	District	2.40	.....	196,366	$25,836.55	13.15
	State	6.45	.....	416,840	54,910.56	13.17
Totals		8.85	.....	613,206	$80,747.11	
Bossier Levee District	District	3.21	.....	238,130	$35,410.11	14.87
	State	4.75	0.11	357,945	53,723.44	15.
Totals		7.96	0.11	596,075	$89,133.55	
Red River Sub-Levee District	State	0.51	.....	7,943	$ 1,191.45	15.
Totals		0.51	.....	7,943	$ 1,191.45	

APPENDIX A. STATEMENT No. 22—Continued. SUMMARY ACCORDING TO DISTRICTS.

Name of District	By Whom Done	MILES New Levee	MILES Enlargement	Cubic Yards	Cost	Average Price—Cents
Red River, Atchafalaya and Bayou Bœuf Levee District	District	2.63	.....	210,446	$41,988.97	19.95
	State	1.74	4.49	230,556	42,008.31	19.05
Totals		4.37	4.49	441,002	$83,992.28	
Red River and Bayou des Glaizes Levee and Drainage District	District	12.68	.....	332,418	$48,965.17	14.73
Totals		12.68	.....	332,418	$48,965.17	

APPENDIX A. STATEMENT No. 22—Continued. SUMMARY ACCORDING TO DISTRICTS.

RECAPITULATION.

Name of District	MILES		Cubic Yards	Cost
	New Levee	Enlargement		
In Arkansas	2.70	60.48	1,391,194.00	$ 279,650.99
In Louisiana—				
Fifth Louisiana Levee District	15.80	36.95	3,444,215.12	658,868.46
Atchafalaya Basin Levee District	5.77	38.13	2,273,760.98	450,082.01
Pontchartrain Levee District	3.56	30.27	1,737,494.46	246,177.02
Lafourche Basin Levee District	1.70	21.17	623,906.86	96,243.68
Orleans Levee District		7.39	77,773.00	30,353.49
Lake Borgne Basin Levee District	1.77		106,029.00	18,316.12
Grand Prairie Levee District	1.16	6.63	154,747.84	24,354.11
Burns Levee District	1.18	3.11	100,739.76	18,681.60
Plaquemines Parish East Bank Levee District	8.12		145,289.00	14,980.18
Caddo Levee District	8.85		613,206.00	80,747.11
Bossier Levee District	7.96	0.11	596,075.00	89,133.55
Red River Parish Sub-Levee District	0.51		7,943.00	1,191.45
Red River, Atchafalaya and Bayou Bœuf Levee District	4.37	4.49	431,002.00	83,902.28
Red River and Bayou Des Glaizes Levee and Drainage District	12.63		382,418.00	48,965.17
Totals	76.17	208.73	12,035,834.02	$2,136,746.22
By the Districts	39.54	57.66	4,279,460.00	$ 882,743.23
By the State	25.60	38.95	3,054,392.00	457,597.16
By the United States	11.03	112.12	4,701,982.02	846,405.83
Totals	76.17	208.73	12,035,834.02	$2,136,746.22

APPENDIX A. STATEMENT No. 23. SUMMARY ACCORDING TO STREAMS.

Approximate quantities and cost of levee work in the several **Levee Districts of Louisiana and in Desha and Chicot Counties,** Arkansas, from April 20, 1904, to April 20, 1906, by the **District, State and United States, as shown in the foregoing statements.**

Stream	Levee District	By Whom Done	MILES New Levee	MILES Enlargem't	Cubic Yards	Cost
Arkansas River— In Arkansas	Tensas Basin	United States	2.70	12.33	627,256	$ 111,583.39
Totals			2.70	12.33	627,256	$ 111,583.39
Mississippi River— In Arkansas	Tensas Basin	District		6.90	219,302	$ 49,095.00
		United States		41.25	544,636	118,981.60
Totals				48.15	763,938	$ 168,076.60
Mississippi River in Louisiana	Fifth Louisiana	District	5.68	11.84	1,039,402	$ 215,412.48
		State	4.33	11.31	996,685	147,841.39
		United States	5.88	13.80	1,408,128.12	290,614.59
	Atchafalaya Basin	District	3.64	14.72	1,253,349	202,676.22
		State	0.21	3.93	148,547	22,207.93
		United States		7.59	357,625.98	71,587.43
	Pontchartrain	District	0.21	5.07	127,861	19,544.79
		State	2.09	3.45	345,941	46,284.09
		United States	1.26	21.75	1,263,692.46	180,348.14
	Lafourche Basin	District	0.08	2.89	55,476	11,208.71
		State	0.65	7.18	160,427	28,430.91
		United States	0.97	11.10	408,093.86	56,604.06
	Orleans	District		0.75	29,584.4	17,786.60
	Lake Borgne Basin	State	1.77		106,029	18,316.12
	Grand Prairie	District				1,961.36
		State	1.16	2.61	78,142	9,373.19
		United States		4.02	76,605.84	13,019.56

APPENDIX A. STATEMENT No. 23—Continued. SUMMARY ACCORDING TO STREAMS.

Stream	Levee District	By Whom Done	MILES New Levee	MILES Enlargem't	Cubic Yards	Cost
Mississippi River—Continued	Buras	District				$ 1,953.83
		State	0.96	2.83	84,796	13,060.71
		United States	0.22	0.28	15,943.76	3,667.06
	Plaquemines Parish East Bank	State	0.51		18,350	3,027.75
Totals			29.62	125.12	7,974,679.42	$1,434,926.92
Red River	Caddo	District	2.40		196,266	$ 25,896.55
		State	6.45		416,840	54,910.56
	Bossier	District	3.21		238,130	35,410.11
		State	4.75	0.11	357,945	53,723.44
	Red River Parish Sub	State	0.51		7,943	1,191 45
	Red River, Atchafalaya and Bayou Bœuf	State	0.44	4.49	127,017	23,347.72
	Red River and Bayou Des Glaizes	District	12.63		332,418	48,965.17
Totals			30.39	4.60	1,676,659	$243,385.00
Atchafalaya	Atchafalaya Basin	District	1.45	8.85	402,048	$ 76,389.12
		State	0.47	3.04	112,191	17,221.31
	Red River, Atchafalaya and Bayou Bœuf	District	2.63		210,446	41,983.97
		State	1.30		93,539	18,660.59
Totals			5.85	11.89	818,224	$154,254.99
Gulf Coast	Plaquemines Parish East Bank	District	7.61		126,889	$11,952.43
Totals			7.61		126,889	$11,952.43
Interior Levees	Orleans	District		6.64	48,188.6	$12,506.89
Totals				6.64	48,188.6	$12,506.89

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APPENDIX A. STATEMENT No. 23—Continued. SUMMARY ACCORDING TO STREAMS.

RECAPITULATION.

	MILES		Cubic Yards	Cost
	New Levee	Enlargement		
Arkansas River in Arkansas	2.70	12.33	627,256.00	$ 111,583.39
Mississippi River in Arkansas	.....	48.15	761,938.00	168,076.60
Mississippi River in Louisiana	29.62	125.12	7,974,679.42	1,434,926.92
Red River	30.39	4.60	1,676,659.00	243,385.00
Atchafalaya River	5.85	11.89	818,224.00	154,254.99
Gulf Coast	7.61	.....	126,889.00	11,952.43
Interior Levees	.....	6.64	48,188.60	12,566.89
Totals	76.17	208.73	12,035,834.02	$2,136,746.22

APPENDIX A. STATEMENT No. 24. SUMMARY.

GRAND TOTAL.

	MILES		Cubic Yards	Cost		Total Cost
	New Levee	Enlargement				
			LEVEE WORK			
Districts	39.54	57.66	4,279,460.00	$ 832,743.23		
State	25.60	38.95	3,054,392.00	457,597.16		
United States	11.03	112.12	4,701,982.02	846,405.83		
Totals	76.17	208.73	12,035,834.02	$2,136,746.22		$2,136,746.22
			DRAINAGE			
	MILES		EXCAVATION			
	Excavation	Clearing	Cubic Yards	Cost	Cost Clearing	Total Cost
District	16.27	14.79	276,404	$355,577.68	$34,697.00	$ 69,274.68
	IMPROVING BAYOU LAFOURCHE					
	MILES					
	Excavation		Cubic Yards	Cost		
Districts	25.69		595,887	$95,341.92		95,341.92
					Total..	$2,301,362.82

APPENDIX B.

COPIES OF SPECIAL REPORTS, LETTERS, ETC., FROM THE BOARD OF STATE ENGINEERS TO THE VARIOUS LEVEE BOARDS AND COMMISSIONERS, POLICE JURIES, THE GOVERNOR OF LOUISIANA, AND TO OTHERS INTERESTED IN OPERATIONS GENERALLY CONNECTED WITH THE DEPARTMENT.

APPENDIX B.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
MONROE, LA., Jan. 10, 1905.

To Mr. W. H. Holloman, President, and to the Board of Commissioners of the Tensas Basin Levee District:

GENTLEMEN—I have the honor to report that both contracts for levee enlargement—viz., Gaines Landing to Panther Forest and Carmichael—are now completed, the sodding and dressing of the former alone remaining to be done, and that with the amount appropriated we have been able to raise the grade on both stretches from a two-foot grade above the high water of 1903, to a three-foot grade, and to extend each contract considerably in length. I thought it unnecessary in doing work so obviously beneficial to your district, and within your appropriation, to call upon your Board for authority, and I call your attention to the fact that each contract has been completed on contract time, the extension alone remaining uncompleted in the matter of Carmichael extension. It is desirable for the work to be carried one station further than we have funds to do under your resolution. I would respectfully request that you pass a resolution appropriating $200 more, or as much thereof as may be necessary for this purpose. The thanks of our Board, as well as yourselves, are due to Capt. E. W. Van C. Lucas for furnishing engineering and inspection on both contracts. He has kept an inspector on each piece of work, since beginning, without cost to your district.

As this may be the last meeting of your Board before the spring rise in the Mississippi, it would not be amiss for you to know what has been accomplished in the improvement of the grade and section of the levees since 1903 water:

On the Arkansas—

From Red Fork to lower end, raised and enlarged...	12	Miles.
On the Mississippi—		
Lucca Loop, South	1.5	"
Station 600 to 677	0.75	"
Arkansas City, front	5	"
Fulton Lake	5	"
Gaines to Panther Forest	2.5	"
Carmichael	1.25	"
Matthews Bend, topped	5	"
Grand Lake to Sterling, enlarged.....	5	"
Sterling to State line	5	"
Ashton	5	"
Total	43	Miles.

From the above you will see that 43 miles, out of a total of 106 approximately, or more than 40 per cent. of the lines affecting you, were improved since 1903 water. These figures speak more eloquently than words of the condition upon which you enter upon your duties for the coming year, yet, just so long as we have funds there is work, and always will be, in the maintenance and improvement of levees. The usual caving points continue to encroach upon your line, and need constantly to be borne in mind. They are as follows:

Lower Lucca, new levee next year.

Chicot Nos. 1 and 2, new levee next year.

Lower Arkansas City, two years.

Gaines Landing, four years.

Panther Forest Short Line, upper end caving slowly.

Lower Matthews Bend, caving slowly.

While I have mentioned these several places, none seem to threaten like Lower Lucca, or the extension of the Lucca Loop Levee, which is now the place we will have to look after in 1905.

I have not with me the exact figures, and make this report from memory, at the request of Mr. Holloman.

Yours respectfully,

The Board of State Engineers,

Per M. P. ROBERTSON,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Hon. J. Q. Graves, President, and Members Board of Commissioners, Tensas Basin Levee District, Monroe, La.:

GENTLEMEN—As requested, I have the honor to submit a list of the new levees that should, this year, be built, and of low stretches that should be brought to grade on the Mississippi River in Desha and Chicot Counties, Ark.

Of this work, the construction of the new levees at Chicot and Grand Lake, and the enlargement of the Panther Forest to Bellevue, are the most important.

I would think that with the Government caring for the new levee necessary at Grand Lake, and the enlargement of the Panther Forest to Bellevue stretch, the Tensas Board should undertake the construction of the new levee required at Chicot. Or, if the United States will undertake the construction of the two new levees, that your district, preferably, should undertake the enlargement of Panther Forest Short Line levee and vicinity (Panther Forest to Bellevue). This would probably require the expenditure by your Board of a sum not exceeding $60,000, while the other two works would cost very much more.

The low stretch of levee at Matthew Bend is topped to a two foot grade, and can wait until other more important work is done.

Whisky Chute Dike is a levee needing some attention, as there is evidence of settlement, and an old crack, about four feet from the top, on river side, is evident, and a shoulder is very plain for about 1,000 feet. This levee should be enlarged to a very high grade to allow for settlement, as a movement in the dike is liable to recommence when it is saturated. The Chicot Board has built a loop around the sand boil at the upper end of the dike, and this should pond the water and neutralize the pressure.

On the whole, the condition of the line is good.

Respectfully submitted,

M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., March 23, 1906.

Estimate of work required to bring levee line in the United States Upper Tensas District, in Arkansas, to a grade 3 feet above high water, 1903, with crown 8 feet, slopes 3 and 3 to 1; and to construct new levees, where required, to same grade and section:

Name of Stretch.	Linear Feet.	Cubic Yards.	Remarks.
	ENLARGEMENT.		
Panther Forest to Bellevue 1614-1854	24,000	265,000	Includes spur at 1670, 15,000 cubic yards. From 1624 to 1669 Com. Grade, 12 foot crown, 3 and 3 to 1 slopes.
Luna Stas. 1910-1942	3,200	30,000	
Whiskey Chute 2400-2562	16,200	120,000	2530 to 2562 M. R. C. Grade, 12 foot crown, slopes 3 and 3 to 1.
Mathews Bend 3410-3671	26,100	185,000	
		600,000	
	NEW LEVEES.		
Mathews Bend	10,100	420,000	Banquette included.
Chicot Loop	7,200	370,000	
Total new levees.....		790,000	
Total enlargement		600,000	
Grand Total		1,390,000	

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS.
NEW ORLEANS, LA., June 14, 1904.

Hon. J. T. McClellan, President Board of Commissioners, Fifth Louisiana Levee District, Tallulah, La.:

DEAR SIR—Your letter of the 11th inst., with stated enclosures, relative to Kempe Bend, and the re-arrangement of the United States Levee District lines, in which the Fifth Louisiana Levee District is situated, was received this morning.

The number of cubic yards of earthwork required to cover the threatened part or parts of the existing line of levee in Kempe Bend, as shown by survey made under the direction of Mr. M. P. Robertson, of this Board, should not much, if at all, exceed 300,000, with a possibility, under more favorable conditions than such as have heretofore been generally looked forward to, of permitting a reduction on a shorter line to half that amount.

In regard to what "is best and possible at Kempe," it is my opinion that a continuance of revetment work there should be strongly encouraged and urged, and that your proposition to build a short line or lines of levee to cover the immediately threatened portion or portions of the existing line of levee in the bend, at the expense of your district, while the work of revetment is continued by the General Government, is the only immediately advisable as well as possible course to pursue that will insure safe and satisfactory results to the district.

I believe that this course is, under any circumstances, advisable to assure the protection of the district against overflow, whether the long line be commenced this season or not, for, judging from past experiences, I do not believe that there is any certainty of the long line of levee being built in any *one* season, no matter what preparations and plans might be devised for its construction; and any threatening aspect in the condition of the revetment or of the existing line of levee behind it, at any time during the period of the construction of the long line, would undoubtedly call for, and precipitate upon all parties in interest, emergency work that would more than probably exceed the cost of the tentative temporary line or lines of levees favored by you.

I think your letters to Colonels Adams and Ernst follow the proper lines, and should command their considerate attention, and be productive of satisfactory results.

Yours very truly,

FRANK M. KERR,
Chief State Engineer.

P. S.—As to the probable cost of the earthwork estimated for the temporary loop or loops at Kempe, it seems to me that if the work were promptly gotten under way at an early date in the season, so that ample time for construction, under ordinary circumstances, could be permitted, the price per cubic yard should not much, if at all, exceed 35 cents.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Sept. 12, 1904.

Hon. J. T. McClellan, President Board of Commissioners, Fifth Louisiana Levee District, Tallulah, Madison Parish, La.:

DEAR SIR—I have visited all points in the Fifth Louisiana Levee District where it was thought that there was a necessity for the construction of a new levee this season, or soon. To take the points in rotation, I beg to submit the following report:

Atherton—Provided for.

Sparta to Duckport—Will last another season.

Reid—Provided for.

Point Pleasant—Change in channel has relieved the situation for many years.

Hard Times—Will not be needed for several years.

Bondurant—Revetment holding.

Kempe—Lower end provided for; upper end will not be needed this year.

Sycamore—Good for a year or more.

Moro—Will not be needed for several years.

Upper Green—Provided for.

Fish-Pond—Provided for.

Surgette-Ashley—Will not be needed this year; nor will Fairview.

We have, therefore, provided for all the new levees necessitated this year, and we have remaining about sufficient funds to do some 200,000 cubic yards of 16-cent work. I forward you herewith an estimate on certain stretches of levee beginning at Cottonwood, and extending to the Mascot New Levee. These contain considerable more yardage than we have funds to build. Of course, we will only be able to undertake such parts of them as come within the above estimate. There are many reasons why each piece should be done. Cottonwood, because it is of low grade, compared to the levees on either side of it, and leaky. The same may be said of Willow Point.

I rather think it is a better policy to get the entire upper end of our district in condition before doing any work lower down, except in the construction of new levees; and I would suggest that we undertake Cottonwood and that portion of levee from Alsatia to Willow Point Loop. Should any funds be left after undertaking

these two pieces, it possibly would be good policy to skip Willow Point Loop for the present, as it is now topped to a grade sufficiently high to stand such a flood as that of last year. On the other hand, I have given Willow Point considerable consideration, from the fact that most of the levee is very much exposed to wave-wash, and very deficient in section; and the new levee that stands behind it is insufficient in grade. Hence, should any breach occur in the Willow Point Levee, I very much doubt if the new Government levee would be able to withstand a flood, and we would possibly lose it. I am, however, of the opinion that we had better continue our work down the river, from the upper end, putting everything in shape as we descend. If you have any other suggestions in regard to this matter, please let me know at once, so that we can proceed to advertise this work, and get it under contract by early in October.

I visited Kempe last week, in company with Mr. Kerr, and made an examination of the revetment and conditions there. I am constrained to say that the revetment work looked like a Russian warship after the Japanese had finished with it. In other words, the upper bank protection is pretty much gone, and many of the mats are sliding down and breaking up, which were placed there for high water protection. In other places, notably at the upper end, the bank has slid down, and turned the mats up above the water surface, so that they are not in the original position in which they were placed. In the unrevetted portion of the bank, in front of the upper half of the Starling loop, the caving has been considerable. I understand, however, that they intend to fill in the blank spaces in the revetment before repairing the other. There is a very swift current there now, and the engineers in charge do not seem to think that much of the revetment has gone at this time, but I happened to be present while soundings were taken by survey party, and there is a step-off at the foot of the mats in the river about 200 feet from shore, which is the usual premonition of a destruction to portions of the revetment.

Both Mr. Douglas and Mr. Geddes seem to be sanguine of holding the bank, and I hope that they will succeed. In the meantime Mr. Jeffries' camp is on the ground, and has cleared considerable at the lower end, next to the Castle, and has probably broken ground by this time. I will locate Mr. Mundinger in the vicinity of Kempe, as a central point from which he can work either end

of the district. I suppose he will remain most of the time with White or Scott.

Please write me your views in regard to the matters contained herein.

Yours truly,
M. P. ROBERTSON,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Hon. J. T. McClellan. President Board of Commissioners, Fifth Louisiana Levee District, Tallulah, La.:

DEAR SIR—I have the honor to submit, herewith, tabulated statement of yardage required to place the levees in the Fifth Louisiana Levee District to a grade 3 feet above the highest previous water, with side slopes of 3 and 3 to 1, and crown of 8 feet; and also on the same section, to the approved commission grade; together with projected locations for new levees, covering the points threatened by caving banks, and approximate yardage required for their construction, on a grade 3 feet above highest water.

The continued fluctuation of the river during the past year, caused by the unusual rainfall in the lower valley, has been disastrous to the banks in the bends, and more than a usual amount of caving has resulted therefrom, thus lessening the lives of many levees.

NEW LEVEES.

The new levees now necessary are Mascot and Duckport in the Upper Tensas District, in Madison Parish; and Sycamore, in the Lower Tensas District, in Concordia Parish. While the latter levee ordinarily would not be required this year, the bank is now actively caving, and the old levee covering this stretch is entirely deficient in grade and section, it not having been improved, except for a mere topping, since 1893-4, and a question as to whether, with the bank as close as it is, and caving, it would justify the enlargement of this stretch rather than the construction of a new loop, besides which the levee is subjected to large waves in high water, owing to its exposed position on the river bank.

As to Mascot and Duckport, the condition of both points is such as to leave no question as to the necessity of two new loops covering

them. Besides these, which are necessary this year, the Palo Alto, L'Argent, Fish Pond and Fairview Levees should be undertaken next season, and if the Hard Times Dike is to be built it should be begun at as early a date as possible.

ENLARGEMENT.

Of the enlargement to be undertaken the Willow Point Loop should be the first considered, as the front line topped and maintained by the district on account of the large area of cleared lands between the two levees, giving a revenue sufficient to maintain it, is now again on a caving bank, and both the lines are deficient in section and grade. The other point is the lower portion of the Lake Palmyra stretch, known as the Perkins, Bland and Burn Levees, and extending from station 980 to station 1267. This stretch should be placed to Commission grade. The new condition caused by the breach in Lake Palmyra at Killecrankie, makes the grade line in the lake an uncertain factor, and as the line is permanent it should at least be raised to Commission grade.

REVETMENT.

The condition in Reid Bend does not improve, and while I have not placed in this report a tentative project for a long line of levee there, it is recognized by those familiar with the situation that the next line will be longer and more difficult of construction than any previously undertaken. It is well known that there is no drainage to this swamp, and that in a wet season it is very doubtful whether any work could be undertaken at all. With this view of the situation, when the river bank gets dangerously close to the levee, it will be practically impossible to construct a small loop, and the country will be endangered from an open gap that cannot be readily closed. With this in view, the Commission should be asked to seriously consider the revetment of the bend.

Hard Times Dike is now threatened, and many surveys have been made, anticipating the time when either a monstrous dike across Lake St. Joseph should be undertaken, or a line around the lake. The situation at Hard Times is becoming acute; the life of the levee line there is not exceeding four years. A location for a levee or dike across Lake St. Joseph would be through water and soft mud. Much settlement is to be expected, and the question of obtaining sufficient earth for its construction is a difficult one. The his-

tory of the present dike is that it settled very much. Therefore, any new line across the lake should be undertaken at least two years before the levee caves in, in order for the earth placed there to come to a bearing. It is now in order for the bank to be revetted.

Kempe—As to Kempe, the present revetment is holding well. The new loop, recently completed opposite the salient, at the lower end of the Starling Loop, and behind the lower end of the revetment, has placed the situation out of danger. The Commission evidently should extend the lower end of the revetment from year to year, covering the other points or the balance of the 15,000 feet yet unrevetted, and assuring for all time the safety of the bend.

Bougere Crevasse.

The United States has undertaken this important work, but has not made an allotment sufficient to complete it. This should be done, as any gap in the line will endanger the whole work. This crevasse, when closed, will give protection to nearly 1,000 square miles of territory, most of which has paid the levee tax for nearly twenty years, some contributing to the construction of levees in the State of Arkansas, and getting no protection. The State and district have built more than twelve miles of levee below the gap, and, as far as I can perceive, it would seem good policy to extend it until Old River is closed.

In conclusion, we will have to hope for the undertaking by the United States of as much work as their resources will allow, soliciting them to bear in mind our many wants.

Respectfully submitted,

The Board of State Engineers,

Per M. P. Robertson,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 29, 1906.

GRADE OF LEVEES IN THE FIFTH LOUISIANA LEVEE DISTRICT COMPARED WITH HIGH WATER OF 1903.

(U. S. UPPER TENSAS DISTRICT.)

Name of Levees.	1′ to 2′ Above.	2′ to 3′ Above.	3 Feet Above.	M. R. C. Grade.
Ashton				
0 to 256	25,600	.....	.....	.....
Bunches Bend				
256-755	.....	.....	.....	49,900
Opossum Point				
755-839	.....	.....	8,400*	.....
839-879	.....	.....	4,000	.....
Wilson Point				
879-929	.....	.....	5,000	.....
929-957	.....	2,800	.....	.....
Cottonwood				
957-1127=1135	.....	.....	17,900	.....
Donna Vista				
1127-1190	6,300	.....	.....	.....
Longwood				
1190-1264	.....	.....	.....	7,400
Hopewell				
1264-1297	.....	.....	3,300	.....
Elton				
1297-1366	.....	7,300	.....	.....
1366-1419	.....	.....	5,300	.....
Elton Slough				
1419-1423	.....	.....	.....	1,400
Elton to Lake Providence				
1433-1539	.....	.....	.....	10,600
Haggaman to Hollybrook				
1539-1809	.....	.....	.....	27,000
Hollybrook Crevasse				
1809-1854	.....	.....	.....	5,400
Otter Bayou to Pt. Lookout				
1854-1986	.....	.....	.....	13,200
Homestead				
1986-2110	12,400	.....	.....	.....
Atherton				
2110-2221	.....	.....	.....	12,600
Alsatia				
2221-2368	.....	14,700	.....	.....
Melville				
2368-2497	.....	.....	12,900	.....
Willow Point Loop				
2497-2715	25,500	.....	.....	.....
Pecan Grove to Henderson				
2715-2810	.....	.....	9,500	.....

Name of Levees.	1' to 2' Above.	2' to 3' Above.	3 Feet Above.	M. R. C. Grade.
Villa Vista				
2810-2865	.....	5,500	.....	.....
2865-3013	.....	14,800*	.....	.....
Mascot				
3013-3045	.....	3,200	.....	.....
Sharkey				
3045-3118	7,300	.....	.....	.....
Buckhorn				
3118-3218	10,000	.....	.....	.....
Omega				
3218-3258	4,000	.....	.....	.....
Morancy				
3258-3330	.....	7,200*	.....	.....
Milliken's Bend				
3330-3480	15,000*	.....	.....	.....
Cabin Teele				
3480-3566=3586	.....	.....	.....	8,600
3586-3680	.....	.....	9,400	.....
Sparta-Duckport				
3680-3763	.....	.....	.....	9,000
Nebraska				
3763-3839	.....	.....	7,600	.....
Willow Slough				
3839-3915	.....	.....	7,600	.....
Killarney				
3915-4002	.....	.....	8,700	.....
Carolina				
4002-4167	.....	.....	16,500	.....
Delta Loop				
4167-4200	.....	.....	3,300	.....
Delta				
4200-4310	.....	.....	11,000	.....
O'Brien				
4310-4397	.....	8,700*	.....	.....
Martin Loop				
4397-4485	.....	.....	10,000	.....
Reid				
4485-4619	.....	.....	13,400*	.....
	106,100	64,200	153,800	145,100
	22%	14%	33%	31%

Note—All work under contract is treated as completed.
* Indicates levee scant in section.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA.. March 29, 1906.

GRADE OF LEVEES IN THE FIFTH LOUISIANA LEVEE DISTRICT COMPARED WITH HIGH WATER 1897.

(U. S. LOWER TENSAS DISTRICT.)

Name of Levees.	1′ to 2′ Above.	2′ to 3′ Above.	3 Feet Above.	M. R. C. Grade.
Christmas				
63-259	.....	19,600	.....	.....
Diamond Island				
259-432	.....	17,300	.....	.....
Bayou Roundaway				
432-536	.....	.....	10,400	.....
Lake Palmyra				
536-740	.....	.....	.....	20,400
740-980	.....	.....	24,000	.....
Perkins				
980-1138	.....	15,800	.....	.....
Bland				
1138-1198	.....	6,000	.....	.....
Burns				
1198-1267	.....	6,900	.....	.....
Point Pleasant				
1267-1345	.....	.....	7,800	.....
Buckridge				
1345-1462	.....	.....	11,700	.....
Elkridge				
1462-1582	.....	.....	12,000	.....
Elkridge to Hardtimes				
1582-1896	.....	.....	.....	31,400
Evergreen				
1896-1992	.....	9,600	.....	.....
Evergreen-Bondurant				
1992-2131	.....	.....	.....	13,900*
2131-2375	.....	.....	.....	24,400
Claggett				
2310-2340	.....	.....	3,000	.....
2340-2352	.....	.....	.....	1,200
Panola				
2362-2500	.....	13,800*	.....	.....
St. Joseph				
2500-2540	.....	.....	.....	4,000
Duckpond				
2540-2617	.....	7,700*	.....	.....
Cottage Home				
2617-2771	.....	.....	.....	15,574
Harper				
2771-2815	.....	.....	4,400	.....
2815-2874	.....	.....	.....	5,900
China Grove-Kempe				
2874-3116	.....	.....	24,200*	.....

Name of Levees.	1′ to 2′ Above.	2′ to 3′ Above.	3 Feet Above.	M. R. C. Grade.
Stockbridge				
3116-3192	.....	.....	7,600*	.....
Hedgeland-Myrtle Grove				
3192-3285	.....	.....	9,300	.....
Waterproof				
3285-3416	.....	13,100	.....	.....
L'Argent				
3416-3526	.....	.....	.....	8,314
Aquasco				
3526-3581	.....	.....	5,500	.....
Monona				
3581-3678	.....	.....	.....	9,700
Delhi				
3678-3800	.....	.....	.....	12,200
Lake St. John				
3800-3900	.....	.....	.....	10,000
Vaucluse				
3900-3941	.....	.....	.....	4,100
Rifle Point				
3941-4109	.....	.....	16,800	.....
Rifle Point to Windmere				
4109-4283	.....	.....	17,400	.....
4283-4338	.....	.....	.....	5,500
Wicame				
4338-4371	.....	.....	3,300	.....
Cleremont				
4371-4414	.....	.....	.....	4,300
4414-4478	.....	.....	6,400	.....
Helena				
4478-4570	.....	.....	9,200	.....
4570-4581	.....	.....	.....	1,100
4581-4603	.....	.....	2,200	.....
Fletcher				
4603-4664	.....	.....	.....	6,100
Sycamore				
4664-4790	.....	.....	13,600	.....
4790-4849	.....	.....	5,900*	.....
Carter's Lane to Vidalia				
4849-5132	.....	.....	28,300	.....
Vidalia				
5132-5202	.....	.....	.....	7,000
Vidalia to Moro				
5202-5565	.....	.....	36,300	.....
Moro				
5565-5720	.....	.....	4,300	.....
Morville				
5720-5806	.....	.....	.....	8,600
Esperanza to Green				
5806-6041	.....	.....	.....	23,500
Green				
6041-6114	.....	.....	6,900	.....
Deer Park				
6114-6187	.....	.....	7,300	.....
Forest Home Fish Pond				
6187-6271	.....	.....	10,675	.....

Name of Levees.	1′ to 2′ Above.	2′ to 3′ Above.	3′ Feet Above.	M. R. C. Grade.
Ashly to Glasscock				
6271-6463	.....	.....	21,300	.....
Glasscock				
6463-6479	.....	.....	.....	1,600
Fairview				
6479-6644	.....	15,100	.....	.....
Roseland				
6644-6743	.....	.....	.....	9,900
Excelsior				
6743-6842	.....	.....	.....	9.900
Wildwood				
6842-6920	.....	.....	.....	7,800
Home Place				
6920-6979	.....	.....	.....	5,900
Ashland				
6979-7025	.....	.....	.....	4,600
Upper Bougere				
0-33	.....	.....	3,300	.....
Lower Concordia				
0-463	.....	.....	46,300	.....
463-524	.....	.....	6,100	.....
524-660	.....	.....	12,600	.....
		124,900	378,075	256,888
		16%	50%	34%

Note—All work under contract is treated as completed, and is placed in the column of grade contemplated.

*Indicates levees scant in section.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 29, 1906.

Statement of work necessary to place levee line in the Fifth Louisiana Levee District to a grade 3 feet above highest water, with crown 8 feet, slopes 3 and 3 to 1:

U. S. UPPER TENSAS DISTRICT IN LOUISIANA.

Name of Levees.	Linear Feet.	Cubic Yards.	Remarks.
Ashton to Bunches Bend Stas. 0 to 256	25,600	155,000	.....
Donna Vista Stas. 1127 to 1190	6,300	40,000	.....
Concord to Atherton 1986-2110	12,400	80,000	.....
Stamboul 2220-2290	7,000	30,000	.....
Alsatia 2290-2368	7,800	45,000	.....
Willow Point Loop 2497 to 2751=2715	25,500	260,000	Abandoning front line.
Villa Vista 2810-2996	18,600	100,000	.....
Mascot to Morancy 3077-3277	20,000	75,000	.....
Milliken's Bend 3330-3480	15,000	90,000	.....
Totals	138,200	875,000	

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 29, 1906.

Statement of work necessary to place levee line in the Fifth Louisiana Levee District to a grade 3 feet above high water 1897, or to Mississippi River Commission Grade, with crown 8 feet, slopes 3 and 3 to 1.

U. S. LOWER TENSAS DISTRICT.

Name of Levee.	Length Linear Feet.	Cubic Yds. for 3' gr. above H. W. 1897.	Cubic Yds. for M. R. C. Grade.
Christmas			
63-259	19,600	60,000	160,000
Diamond Island			
259-432	17,300	70,000	175,000
Perkins			
980-1138	15,800	85,000	175,000
Bland			
1138-1198	6,000	10,000	55,000
Burn			
1198-1267	6,900	11.000	70,000
Point Pleasant			
1267-1345	7,800	.....	50,000
Buckridge			
1345-1462	11,700	.....	80,000
Elkridge			
1462-1582	12,000	.....	125,000
Evergreen			
1895-1992	9,700	.....	70,000
Claggett			
2310-2340	3,000	.....	25,000
Beaumont			
2362-2392	3,000	.....	20,000
Bruin Bayou			
2392-2405	1,300	8,000	20,000
Panola			
2405 to 2500	9,500	25,000	60,000
Duckpond			
2540-2617	7,700	28,000	65,000
Harper			
2771-2815	4,400	.....	25,000
2874-2951	7,400	.....	50,000
Kempe			
2951-2981	3,000	10,000	35,000
2981 to 3035	5,700	.....	60,000
Goldman			
3035-3114	7,900	.....	80,000
Stockbridge			
3114-3192	7,800	.....	70,000
Hedgeland			
3192-3285	9,300	.....	60,000

Name of Levee.	Length Linear Feet.	Cubic Yds. for 3' gr. above H. W. 1897.	Cubic Yds. for M. R. C. Grade.
Myrtle Grove			
3285-3352	6,700	.....	50,000
Waterproof			
3352-3416	6,400	.....	50,000
Aquasco			
3526-3581	5,500	.....	50,000
Lake Concordia			
3942-4283	34,100	.....	290,000
4338-4371	3,300	.....	30,000
4414-4520	10,600	.....	110,000
4520-4570	5,000	.....	60,000
4581-4603	2,200	.....	40,000
Minorca			
4853-5132	27,900	.....	250,000
Arnauldia			
5202-5287	8,500	.....	55,000
White Hall			
5287-5394	10,700	.....	90,000
White Hall to Moro			
5394-5665	27,100	.....	195,000
Moro to Warnicut			
5719-5806	8,700	.....	50,000
Deer Park			
6114-6187	7,300	15,000	60,000
Ashley			
6271-6401=6380	13,000	.....	100,000
Glasscock			
6380-6463	8,300	.....	95,000
Glasscock to Fairview			
6479-6588	10,900	.....	115,000
Fairview			
6588-6644	4,200	.....	35,000
Totals	377,200	322,000	3,265,000

Note—Consideration of the improvement of the line of levee below Bougere Crevasse, some 12.5 miles in length, is deferred until the completion of the levee at Bougere.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 31, 1906.

Statement of approximate yardage for new levees necessary in the Fifth Louisiana Levee District, based on grade 3 feet above highest water, with crown 8 feet, slopes 3 and 3 to 1:

U. S. UPPER TENSAS DISTRICT.

Name of Levee.	Approximate Length Feet.	Approximate Contents Cubic Yds.
‡Morancy	8,200	175,000
‡Mascot	9,300	360,000
†Duckport	7,600	225,000
		760,000

U. S. LOWER TENSAS.

‡Hardtimes	11,800	525,000
†Sycamore	11,000	300,000
‡Palo Alto	4,500	100,000
‡L'Argent	6,600	200,000
‡Fishpond	11,900	310,000
‡Fairview	12,500	350,000
		1,780,000

†Indicates new levees of immediate necessity.
‡Indicates new levees of secondary importance.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 6, 1905.

To Hon. V. M. Lefebvre, President, and to the Members of the Board of Commissioners, Atchafalaya Basin Levee District, Port Allen, La.:

GENTLEMEN—On the occasion of your regular quarterly meeting to be held at Port Allen on July 10, 1905, I beg to submit to you the following report on the general condition of the levees in your district, and of the work now being carried thereon.

For the past five years your Board, assisted by the United States Government and State funds, has been steadily engaged in bringing your levees to commission grade throughout the district. This

work has been practically completed from Barbre's Landing to Germania Store, with the exception of some 9 miles of levees, the enlargement of which, however, is under contract, and for which construction notes have been issued. These 9 miles will probably be completed by the end of the present year. This leaves about 10 miles from Germania Store to Donaldsonville, which is still below commission grade, and if you continue the work at the rate at which you have been doing it, these 10 miles should be completed in 1906.

The United States Government holds now to the credit of the Atchafalaya Basin Levee District some $70,000, which will probably be placed under contract during the current year—probably to construct new levees which may become necessary at Picayuneville, Raccourci and Arbroth. The construction of new levees will probably be also necessary at Torras and Bayou Goula. These points are under close surveillance, and, should caving develop, work should be begun thereon at once. In fact, I would recommend the beginning of a new levee at Bayou Goula shortly, as this is in a caving reach, and in all likelihood will cave in this season.

The work of enlargement has been steadily progressing on the Atchafalaya River, and the present year should see the completion of the enlargement of all of the low points between Bayou Latanache and a point 4 miles below Melville. This work, which is being carried on under the contract which you have with the Board of Control of the State Penitentiary, has been interrupted by the present high water, but will be resumed very shortly.

When this comparatively small amount of work has been done, you will have your Mississippi River line up to Commission grade. It will be time then to consider the systematic enlargement of the section of your levees, so as to make them absolutely safe against any flood which is likely to come against them. This enlargement has, in different parts of the Mississippi Valley, taken different forms, some districts increasing the slopes of the levees, other districts building large and substantial banquettes on the land side of the levee. Owing to the thickly settled condition of the Atchafalaya Basin Levee District and the consequent disturbance which would result to property and to travel by the building of banquettes on the land side, and also owing to the fact that you could not easily procure earth on the land side, but would have to haul it over the levee to the land side, which would be a very expensive

operation, I think it would be injudicious to undertake such a system of banquettes. It would be, in my mind, more desirable to increase the river slope or build high banquettes on the river slope, which would be more economical to construct and which would generally be better for the levee. The section to be given to this work can be discussed later.

I believe, however, that as this work can be begun at stated points and carried on in a systematic manner, that the use of machinery on such work would be advantageous and would result in your doing the work at very much reduced figures. I believe that by giving close attention to the subject you could devise a system which would enable you to do the work at such reduced figures compared to the present prevailing prices for levee work that in eight years you could have your entire levee line built to such section that you might consider it practically completed, with the exception of such renewals of levees as might beome necessary by reason of caving banks.

This matter is one deserving of serious consideration, and which I earnestly recommend to your attention.

Very respectfully yours,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 20, 1906.

To the Honorable President and Members, Board of Commissioners for the Pontchartrain Levee District, Convent, La.:

GENTLEMEN—I beg leave to transmit to your Board copy of a statement compiled by me, on the second instant, at the request of the Chief State Engineer, to be presented by him to the Mississippi River Commission on their annual high water inspection trip. This statement contains, in detail, the approximate elevaton of your levees above the highest water in your district, also approximate quantity of earthwork necessary to place said line to the Mississippi River Commission grade, with crown 8 feet, slopes 3 and 3 to 1; also contains an estimate, based on the same grade, for new levees required in anticipation of future caving banks and the rebuilding of certain stretches of levee, deficient in cross section, which are too near the river bank to be enlarged;

also contains a table of the grade of levees, by parishes, as compared with the highest water in the river.

The summary in cubic yards of earthwork amounts to as follows:

	Cubic Yards.
For enlargement	852,000
For new levees	629,000
	1,481,000

In comparing this statement with the one made by me to your Board on June 16, 1903, I find the following yardage has since been placed on the levees of your district:

	Cubic Yards.	Cost.
By the United States	1,500,064	$204,780.19
By the State	400,898	56,169.10
By the District	705,313	122,696.78
Totals	2,606,275	$383,646 07

Since the organization of your district, by Act 95 of 1890, the State has expended the following amounts of the 1 mill tax, as allotted by the Board of State Engineers to your district:

Year.	Cubic Yards.	Cost.
1891	122,570	$20,199.53
1892	146,130	17.243.34
1893	120,946	15,420.61
1894	143,879	17,794.34
1895	140,037	19,611.04
1896	83,323	12.498.60
1897	76,891	15,100.00
1898	74,792	14,691.77
1899	76,951	15,390.20
1900	85,261	15.168.24
1901	31,455	5,896.60
1902	230,379	40,770.18
1903	48,760	9,020.53
1904	179,021	22.998.75
1905	182,000	25,389.00
	1,752,395	$267,192.73

Or an average of over $17,800 annually.

The United States Government has expended in your district, since its organization, the following amounts:

Year to Year.	Cubic Yards.	Total Cost.
July 1, 1890, to June 30, 1892	597,788.56	$106,206.13
July 1, 1892, to June 30, 1893	587,846.09	116,370.47
July 1, 1893, to June 30, 1894	900,838.54	127,711.46
July 1, 1893, to June 30, 1894	536,827.31	59,398.11
July 1, 1894, to June 30, 1895	635,776.86	74,180.73
July 1, 1895, to June 30, 1896	1,123,188.17	96,073.00
July 1, 1896, to June 30, 1897	476,156.45	44,877.68
July 1, 1897, to June 30, 1898	472,849.70	55,766.24
July 1, 1898, to June 30, 1899	385,772.05	50,518.61
July 1, 1899, to June 30, 1900	456,140.23	62,596.93
July 1, 1900, to June 30, 1901	868,649.30	101,804.67
July 1, 1901, to June 30, 1902	No work done	.....
July 1, 1902, to June 30, 1903	611,760.10	72,052.48
July 1, 1903, to June 30, 1904	485,235.72	65,437.28
July 1, 1904, to June 30, 1905	1,014,828.60	139,342.91
Totals	9,153,657.68	1,272,336.80

Year to Year.	Filled Excavations Cubic Yards.	Total Cost.	Tile Drains Linear Yards.	Total Cost.
July 1, 1892, to June 30, 1893	15,659.31	$2,670.46	10,268 1-6	$3,428.35
July 1, 1893, to June 30, 1894	2,565.69	314.53	.....	.....
July 1, 1893, to June 30, 1894	11,842.11	1,249.13	.....	.....
July 1, 1894, to June 30, 1895	16,428.62	1,761.54	.....	.....
Totals	46,495.73	$5,995.66	10,268 1-6	$3,428.35

Information in regard to the amounts expended by the United States Government in your district from June 30, 1905, to date, is not, at this time, available.

From information received, your district has expended from its organization to date for work under contracts and for repair work, high water expenses, etc., some $796,568.66.

Very respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Statement showing approximate elevation of levees above highest water in the Pontchartrain Levee District, also quantity of earthwork necessary to place said levee line to the Mississippi River Commission grade, with crown 8 feet, slopes 3 and 3 to 1:

EAST BATON ROUGE PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Baton Rouge to Arlington 0 to 152	15,200	4.0	....	Caving bank 134 + 64 to 151 + 63, new levee required.
Arlington 152-204+78=201+49	5,315	M. R. C.		
Arlington to Conrad 201=49-325	12,450	3.9	65,000	
Conrad 325-412	8,700	M. R. C.	....	Few low places should be repaired.
Martinez to Burtville 412-691	27,900	3.0	120,000	
Woodstock 691-740	4,900	M. R. C.	....	
Totals	74,465	.....	185,000	

IBERVILLE PARISH.

Manchac to Billings 740-976	23,600	M. R. C.	....	
Billings 976-1020	4,400	3.0	32,000	
Folse 1020-1073	5,100	M. R. C.	....	
Gomez 1073-1106	3,300	2.5	20,000	
Landry 1106-1364	25,800	M. R. C.	....	
Willow Glen 1364-1448	8,400	3.0	60,000	
Oakley 1448-1504	5,600	M. R. C.	....	
Margaret 1504-1557	5,300	M. R. C.	....	Under contract by U. S.
Virginia to Parish line 1557-2147	59,000	M. R. C.	....	
Totals	140.500	.....	112,000	

ASCENSION PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Parish line to Helene 2147–2355	20,800	M. R. C.	....	
Belle Helene 2355–2494	3,500	M. R. C.	....	Under contract by U. S.
Willow Grove 2494-2509	1,500	3.5	10,000	
Gem 2509–2520	1,100	2.5	10,000	Caving bank 2507+71 to 2530, new levee required.
Gem to Burnside 2520–3020	50,000	M. R. C.	....	
Burnside 3020–3041	2,100	2.0	15,000	
Burnside to Parish line.	9,900	M. R. C.	....	
Totals	88,900	.....	35,000	

ST. JAMES PARISH.

Parish line to St. Mary 3140–3238	9,800	2.0	50,000	Caving bank 3163 to 3185, new levee required.
St. Mary to St. Elmo 3238–4044	80,600	M. R. C.	....	
Bourbon 4044–4110	6,600	M. R. C.	....	Under contract by U. S.
Bourbon to Lutcher 4110–4231	12,100	M. R. C.	....	4201 to 4216 new levee may be required.
Lutcher 4231–4239	800	1.5	6,000	
Lutcher to Parish line..	11,900	M. R. C.	....	
Totals	121,800	.....	56,000	

ST. JOHN PARISH.

Parish line to New Hope 4358–4442	8,400	M. R. C.	....	
New Hope 4442–4467	2,500	1.5	25,000	
Hope 4467–4490	2,300	1.5	25,000	Caving bank 4467 to 4489, new levee required.
Hope to Bonnet Carre 4490–5016	52,600	M. R. C.	....	
Bonnet Carre to Parish line 5016–5108	8,200	2.5	85,000	
5108–5142	3,400	M. R. C.	....	
Totals	77,400	.....	135,000	

ST. CHARLES PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Parish line to Diamond 5142–5350	20,800	M. R. C.	....	
Diamond 5350–5363	1,300	M. R. C.	....	Under contract by State.
Diamond New Levee 5363–5396	3,170	M. R. C.	....	Under contract by State.
Good Hope 5396–5434	3,800	M. R. C.	....	
Prospect 5434–5517	8,300	1.5	60,000	
Sarpy Crevasse 5517–5545	2,800	0.5	45,000	
Victoria 5545–5600	5,500	M. R. C.	49,000	Under contract by District.
Ormond 5600–5654	5,400	1.0	36,000	
Red Church-Pecan Grove 5654–5756	10,200	M. R. C.	....	
Pecan Grove 5766–5832	6,600	2.0	65,000	Includes rectification of line.
St. Rose–Almedia 5832–5961	12,900	M. R. C.	....	
Fairview 5961-6024	6,300	3.0	30,000	
Totals	87,070	.....	285,000	

JEFFERSON PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Parish line to Shrewsberry 6024–6554	53,000	M. R. C.	....	Caving bank 6232 to 6257, new levee required.
Macedonia Church 6554–6578	2,400	3.0	12,000	Caving bank 6567 to 6585, new levee required.
Upper South Port 6578–6595	1,700	1.5	17,000	
Lower South Port 6595-6608	1,300	3.5	10,000	6596 to 6609 caving bank, new levee required. Old levee deficient in section.
South Port to Parish line 6608-6630	2,200	3.5	5,000	Old levee deficient in section.
Total	60,000	.....	44,000	

Note—M. R. C. means Mississippi River Commission Grade approved *June 18, 1898*, and is a grade fixed 4.6 feet above high water, 1897, at *Baton Rouge*, and 3.3 feet at the Parish line of Jefferson and Orleans.

RECAPITULATION BY PARISHES.

Parishes.	Length of Line.	Cubic Yards.
East Baton Rouge	74,465	185,000
Iberville	140,500	112,000
Ascension	88,900	35,000
St. James	121,800	56,000
St. John	77,400	135,000
St. Charles	87,070	285,000
Jefferson	60,600	44,000
Grand totals	650,735	852,000

Note—All work noted in the column of remarks as "under contract" is treated as completed work, and the grade given in the column headed "Feet Above H. W." is that to which the work is to be built.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Estimate for new levees required in the Pontchartrain Levee District. Based on Mississippi River Commission grade, with crown 8 feet, slopes 3 and 3 to 1:

Name of Levee.	Length in Feet.	Cubic Yards Required.	Remarks.
East Baton Rouge Parish.			
Arlington			
134+64-151+63	2,500	120,000	
Ascension Parish.			
Gem			
2507+71-2530	2,500	127,000	
St. James Parish.			
Union			
3163-3185	2,500	65,000	
Poche			
4201-4216	2,000	40,000	
St. John Parish.			
Hope			
4467-4489	2,300	77,000	
Jefferson Parish.			
Albert Spies	2,700	80,000	
Upper Southport			
6567-6585	1,800	60,000	
Lower Southport			
6596-6609	1,800	60,000	
Totals	18,100	629,000	

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Grades of levees in the Pontchartrain Levee District on completion of outstanding contracts, compared with high water of 1897:

Parish.	0 to 1' Above.	1' to 2' Above.	2' to 3' Above.	3 Feet Above.	M. R. C. Grade.
E. Baton Rouge	.....	.....	40,330	15,200	18,915
Iberville	.....	.....	16,100	.....	124,400
Ascension	.....	.....	3,200	1,500	84,200
St. James	.....	10,600	.....	.....	111,200
St. John	.....	4,800	8,200	.....	64,400
St. Charles	8,200	14,900	6,300	.....	57,670
Jefferson	.....	1,700	2,400	3,500	53,000
Totals	8,200	32,000	76,550	20,200	513,785
Percentages	1.2%	4.9%	11.6%	3.1%	79.2%

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 22, 1904.

Hon. Victor Maurin, President Board of Commissioners, Lafourche Basin Levee District, Donaldsonville, La.:

DEAR SIR—I have just returned from a recent inspection of the levees on Bayou Lafourche, east bank, from Donaldsonville to Raceland, as my attention was called to the fact that there had been promiscuous cutting of the levees on the bayou. I did not continue the inspection from Raceland to the lower end of the system, as I am satisfied that the Commissioner for the Parish of Lafourche, Hon. David Foret, is familiar with the facts if levees have been injured in that section of Bayou Lafourche.

Whilst there has not been any complete destruction of the levee at any one point except where the Theriot Canal enters Bayou Lafourche, yet I found that ramps had been built in the different parishes, and in the construction thereof the existing levees have been cut down on the land side, thereby injuring the levee, notably on the front of Crescent Plantation, about three miles below Donaldsonville, in Ascension Parish; ferry cut and ramp at Valenzuela Store; ferry cut and ramp just above store on Numa Vives' Plantation; ramp and cut through old levee at Captain Charley's, just above Plattenville, all in Assumption Parish. At

the upper end of Greenwood new levee, in Lafourche Parish, parties are tunneling a hole through the old levee, for what purpose I do not know, but nearly two-thirds of the levee is bored through. This is a very dangerous old levee and has always given us trouble during high water. The proprietor of the place is Mr. Ernest Roger. At Lafourche Crossing, in order to facilitate the hoisting of freight, some parties have cut down the levee 4 feet deep and 30 feet wide. At Raceland parties have done likewise for the same purpose. Below and above the Theriot Canal, which was recently dug into Bayou Lafourche, the levees have been cut and ramps have been built on both sides.

Now, Act 84 of the General Assembly of 1902 says: "That the law governing levee cutting shall continue to apply to Bayou Lafourche levees, as if the dam had not been constructed." And the law governing levee cutting is to be found in Section 3, Act 84 of 1886, which makes it a crime, punishable by imprisonment for a term not exceeding five years and not less than six months, and a fine not exceeding five hundred dollars, to cut any levee for any other purpose except for the repair or reconstruction of the levee, etc.; all of which is respectfully submitted for your consideration.

Respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 12, 1906.

To the Honorable President and Members of the Board of Commissioners for the Lafourche Basin Levee District:

GENTLEMEN—For your information I desire to transmit to your Board a copy of a statement compiled by me on the 2d inst., to be presented by the Chief State Engineer to the Mississippi River Commission on their recent annual high water inspection trip. Ths statement contains the approximate elevation of your levees above the highest water in your district, with approximate quantity of earthwork necessary to place said levee line above the Parish of Orleans to the Mississippi River Commission grade, and in the Parish of Plaquemines to a grade 3 feet above the high water of 1903, with crown 8 feet, slopes 3 and 3 to 1; also contains an estimate, based on the same grades, for new levees required in

anticipation of future caving banks and the rebuilding of certain stretches of levees deficient in cross section, which are too near the river bank to be enlarged; also contains a table of the grade of levees, by parishes, as compared with the highest water in the river:

The summary in cubic yards of earthwork amounts to as follows:

	Cubic Yards.
For enlargement	747,500
For new levees	546,000
	1,293,500

By comparing this statement with the one made by me to your Board on June 1, 1903, I find that the following yardage has since been placed on the levees of your district, viz.:

	Cubic Yards.	Cost
the United States (to June 30, 1905)	455,444	$ 62,880.65
the State	303,821	67,956.30
the District	383,735	76,949.18
Totals	1,143,000	$206,786.13

Information in regard to the amount of work done by the United States in your district from June 30, 1905, to date, is not, at this time, available.

Since the organization of your district, under Act 13 of 1892, the State has expended the following amounts of the 1 mill tax, as allotted by the Board of State Engineers to your district:

1893	$22,833.64
1894	17,825.06
1895	16,606.09
1896	21,628.54
1897	20,806.10
1898	18,599.59
1899	15,996.89
1900	13,134.83
1901	30,461.20
1902	19,999.63
1903	19,525.76
1904	26,710.29
1905	30,000.00
	$274,127.62

The State has under contract, out of the allotment to the district for 1905, the following levees, viz.: Jack Strange Levee, St. John Parish, estimated contents 95,000 cubic yards, price 18.95 cents per cubic yard, estimated cost $18,002.50; La Reussite, Plaquemines Parish, estimated contents 69,988 cubic yards, price 16.74 cents per cubic yard, estimated cost $11,714.99.

The United States Government has expended in your district from its organization to June 30, 1905, $632,417.12.

Your district has expended from its organization to date some $1,308,913.44.

Very respectfully submitted,

The Board of State Engineers,

Per SIDNEY F. LEWIS,

Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Statement showing approximate elevation of levees above highest water in the Lafourche Levee District; also approximate quantity of earthwork necessary to place said levee line to the Mississippi River Commission grade, with crown 8 feet, slopes 3 and 3 to 1:

ASCENSION PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Donaldsonville Front 0 to 62	6,200	3.6	50,000	Includes rectification of line.
Peytavin to Parish line 62–394	32,800	M. R. C.	.....	
Totals	39,000	.....	50.000	

ST. JAMES PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Parish line to St. James Church 394 to 876	48,200	M. R. C.	.....	473 to 492 caving bank, new levee required. 577 to 592 caving bank, new levee required.
St. James Estate 876-893	1,700	1.5	14,000	Under contract by Dist.
St. James Estate to Pike's Peak 893-1048	15,500	M. R. C.	.....	
Pike's Peak 1048-1082	4,500	3.0	25,000	1023 to 1041 caving, new levee required.
Pike's Peak to Magnolia 1082–1423	34,100	M. R. C.	.....	
Magnolia to Parish line 1423–1527	10,600	3.0	75,000	Includes rectification of line.
Totals	114,600	.....	114,000	

ST. JOHN PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Parish line to Stevenson 1527-1786	25,900	M. R. C.	.....	
Stevenson 1786–1823	3,700	3.0	20,000	
Jack Strange 1823-1849	2,800	M. R. C.	.....	Under contract by State.
Bonsecour 1849-1881	3,200	3.0	20,000	
Alliance 1881–1937	5,600	M. R. C.	.....	
Columbia 1937–2065	12,800	M. R. C.	.....	Under contract by U. S.
Tigerville to Parish line 2065–2310	24,500	M. R. C.	.....	
Totals	78,500	.....	40,000	

ST. CHARLES PARISH.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Hymelia to Waterford 2310–2470	16,000	M. R. C.	.....	
Waterford 2470–2635	16,500	M. R. C.	.....	Under contract by U. S.
Pelican to Flagtown 2635–2774	14,400	M. R. C.	.....	
Flagtown to Ashton 2774–2898	12,400	2.5	75,000	Caving bank 2853 to 2863, new levee required.
Ashton to Louisa 2898–3111	21,300	M. R. C.	.....	
Louisa 3111 to 3152	4,100	2.5	20,000	
Roger Valle 3152–3166	1,610	M. R. C.	.....	
Cooperville 3166–3193	2,700	2.5	15,000	
Cooperville to Parish line 3193–3274	8,100	M. R. C.	.....	
Totals	97,110	.....	110,000	

JEFFERSON PARISH.

Orange Grove to Willow Grove 3277–3463	18,900	M. R. C.	.....	
Willswood 3463–3525	6,200	M. R. C.	.....	Under contract by U S.
Willow Grove 3525-3810	28,500	M. R. C.	.....	3599 to 3607 and 3612 to 3629, caving, new levee required.
Nine Mile Point 3810–3919	10,900	2.5	70,000	
Westwego 3919–3953	3,400	M. R. C.	.....	
Company Canal 3953–3968	1.500	2.0	15,000	
Ames 3968–4064	9,600	M. R. C.	.....	
Amesville 4064–4092	2,800	1.5	20,000	
Marrero 4092–4102	1,000	M. R. C.	.....	
Getzinger 4102–4136	3,400	2.3	30,000	
Beauregard 4136–4166	3,000	M. R. C.	.....	
Harvey to McDonoghville 4166–4255	8,900	2.0	40,000	
McDonoghville 4255–4309	5,400	M. R. C.	.....	
Texas Pacific Terminal 4309–4332	2,100	2.0	20,000	
Totals	85,600	.....	195,000	

PLAQUEMINES PARISH, RIGHT BANK, BEGINNING UNITED STATES BARATARIA LEVEE DISTRICT.

(Estimate is based on grade 3 feet above high water of 1903.)

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Parish line to Belle Chasse	27,200	3.0	.....	
St. Ann				
1380–1428	4,800	1.5	26,000	
1428–1456	2,800	3.0	.....	
Concession				
1456–1506	5,000	1.5	25,000	
Concession to Oak Pt.				
1506–1581	7,500	3.0	.....	
Oak Point				
1581–1741	16,000	3.0	.....	Under contract by U. S.
Live Oak				
1741–1782	4,100	3.0	.....	
Barrois				
1782-1801	2,100	2.0	12,000	
'Jesuits' Bend	11,600	0.5	100,000	This stretch only stands to high water for 30 stations.
Star				
1917–1939	2,200	3.0	.....	
tar to La Reussite				
1939–2053	11,400	3.0	.....	Under contract by Dist.
La Reussite to Alliance				
2053-2110	5,700	3.0	.....	Under contract by State
Alliance to Ironton				
2110–2239	12,900	3.0	.....	
Ironton				
2239–2260	2,100	0.5–1	15,000	
Myrtle Grove				
2260–2303	4,300	3.0	.....	
2303–2318	1,500	0–2	8,500	
2318–2339	1,073	2.0	3,500	
Myrtle Grove to Purcell				
2329–2440	6,800	3.0	.....	
Wood Park to Deer Range				
2440–2463*	2,300	1–2	.....	New levee necessary.
Deer Range				
2463–2585	12,200	3.0	.....	
Junior				
2585–2601*	1,600	0.5	.....	New levee necessary.
Junior to Pointe Celeste				
2601–2665	6,000	3.0	.....	
Pointe Celeste to Woodland				
2665–2703†	3,800	2.0	8,500	New levee necessary.
Woodland				
2703–2784	8,100	3.0	.....	
Woodland to Magnolia				
2784–2867†	8,300	1.5	30,000	New levee necessary.

Name of Levee.	Linear Feet.	Feet Above H. W.	Cubic Yards.	Remarks.
Magnolia				
2867–2890	2,540	3.0	.....	
2890–3041	15,100	3.0	.....	Under contract by U. S.
Barthelmy Settlement				
3041–3072†	3,100	1.5	10,000	New levee necessary.
Riceland				
3072–3103	3,100	3.0	.....	
Totals	195,213	.....	238,500	

*This stretch of levee stood about H. W. of 1903, and was subsequently capped by district about 2.0 feet. Section scant. Portion of levee will have to be rectified, being too near river bank to be enlarged to standard section.

*This stretch is low and deficient in section, and too near river bank to be enlarged. New levee necessary.

*This stretch is low and deficient in section, and too near river bank to be enlarged.

†New levee necessary, too near river bank to be enlarged.

†New levee necessary, caving bank, too near to be enlarged.

***New levee necessary, too near bank to be enlarged.

Note—M. R. C. means Mississippi River Commission, Approved Grade, June 18, 1898, and is a grade fixed 4.2 feet above H. W. 1897, at Donaldsonville, and 3 feet at Riceland.

Note—Work under contract treated as completed.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Recapitulation by parishes of cubic yards necessary to place levee line in the Lafourche Levee District to the Mississippi River Commission grade, with crown 8 feet, slopes 3 and 3 to 1:

Parish.	Linear Feet.	Cubic Yards.
Ascension	39,000	50,000
St. James	114,600	114,000
St. John	78,500	40,000
St. Charles	97,110	110,000
Jefferson	105,600	195,000
Plaquemines	195,213	*238,500
Totals	630,023	747,500

*Estimate based on grade 3 feet above H. W. 1903.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Grade of levees in the Lafourche Levee District compared with high water 1897 above New Orleans, and high water 1903 below New Orleans (when existing contracts are completed):

Parish.	0 to 1' Above.	1' to 2' Above.	2' to 3' Above.	3 Feet Above.	M. R. C. Grade.
Ascension	.....	.....	.....	6,200	32,800
St. James	.....	1,700	10,600	4,500	97,800
John	.....	.....	6,900	.....	71,600
Charles	.....	.....	19,200	.....	77,910
Jefferson	.....	15,300	14,300	.....	76,000
Totals	.....	17,000	51,000	10,700	356,110
Percentages		4%	12%	2%	82%
(Compared with H. W. 1903.)					
Plaquemines	16,800	30,473	115,440	32,500	.....

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Estimate for new levees required in the Lafourche Levee District (based on Mississippi River Commission grade, with crown 8 feet, slopes 3. and 3 to 1:

ST. JAMES PARISH.

Name of Levee.	Length in Feet.	Cubic Yards required	Remarks.
Lauderdale 473-492	2,000	60,000	
Rateau	1,500	50,000	
Rich. Bend 1023-1041	2,300	96,000	
St. Charles Parish.			
Speranza 2853-2863	1,300	31,000	

JEFFERSON PARISH.

Upper Avondale 3599-3607	1,200	32,000	
Lower Avondale 3512-3629	1,500	40,000	
Plaquemine Parish.			Based on grade 3 feet above H. W. 1903.
Myrtle Grove 2329-2345	1,800	30,000	
Purcell 2441-2463	2,300	45,000	
Junior 2583-2601	1,800	30,000	
Pointe Celeste 2666-2684	2,000	30,000	
West Pointe a la Hache 2819-2868	4,900	70,000	
Socola Canal 3053-3072	2,200	32,000	
Totals	24,800	546,000	

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Dec. 13, 1904.

Hon. John Dymond, President Board of Commissioners, Lake Borgne Basin Levee District, Belair, La.:

DEAR SIR—The Board of State Engineers has the honor to acknowledge the receipt of your letter of the 29th ult., saying: "Mr. W. C. Dotterer, General Manager of the New Orleans Terminal Company, appeared before our Board at its last regular meeting, which was held November 18, asking our Board to consider the cutting of the public levee near their Chalmette property and building slips for shipping within the limits of the property, all presumed to be adequately protected against danger from the river. I have submitted to you the plans and specifications for the proposed work, as sent in to our Board by Mr. Dotterer, and would ask you to please consider them at your earliest convenience and report back to our Board whether or not you think that the protection of the Lake Borgne Levee District would be adequate with such works as they contemplate and with such limits, as to time and additional work and to maintenance, if any be needed, that you may suggest."

In compliance with your request, the Board of State Engineers begs leave to submit the following report:

The project proposed by the New Orleans Terminal Company at Port Chalmette, as far as it concerns the Lake Borgne Levee District, appears, from your letter and the general outline, maps and plans submitted to you by Mr. Dotterer, and left by you with the Board of State Engineers for inspection and consideration, to involve the condemnation and removal of parts of your established line of public levee on the river front of your district at certain points designated on the maps, and to excavate to certain dimensions inland, and to a depth of thirty (30) feet below the lowest water recorded in the Mississippi River, opposite, a series of slips for harboring ships and other craft, and to restore and maintain, by means of walls of masonry, set on piling, earth reinforcements, grading and other means, the continuity of the line of public levee *around* the proposed slips, under such regulations and safeguards for the protection of the Lake Borgne Levee District as your Board of Commissioners may deem necessary to impose.

Waiving consideration of legal restrictions, the Board of State Engineers sees no inherent objection to the project proposed by the New Orleans Terminal Company at Port Chalmette, nor does it believe that any serious menace "to the protection of the Lake Borgne Levee District" is necessarily involved in its consummation; provided, the following general conditions and specifications be, by special contract, duly executed between the New Orleans Terminal Company and the Lake Borgne Levee District, imposed and enforced, viz.:

1. That, before any excavation nearer the base of the present controlling line of public levee than 250 feet be permitted a line of levee, the axis of which shall not be less than 250 feet distant from the perimeter of any proposed slip, shall be built and completed by the New Orleans Terminal Company *around* the proposed slip, to a proper junction with the controlling line of public levee above and below the proposed slip, as may be determined by the Board of State Engineers, all work to be done in strict conformity with all the general conditions and specifications usually prescribed by the Board of State Engineers for levee work, and to a grade not less than 5 feet above the high water of 1903 in the river opposite the proposed slips, with due allowance for shrinkage and settlement, crown not less than 20 feet wide and slopes not steeper than 3 to 1.

2. That the New Orleans Terminal Company shall obligate itself, its successors and assigns, by bond, duly approved and accepted by the Lake Borgne Levee District, to protect, preserve and maintain said line of levee, as a public levee, at its entire expense and to the satisfaction of the Lake Borgne Levee District, during the life of said New Orleans Terminal Company, its successors or assigns, and to cover any and all losses, damages and injuries to the Lake Borgne Levee District, resulting from the failure of said New Orleans Terminal Company, its successors or assigns, to so protect, preserve and maintain said line of public levee.

3. That the absolute control and jurisdiction over such a line of levee shall remain in full force and effect with the Lake Borgne Levee District, as contemplated by law for all the public levees of the district.

Respectfully,

The Board of State Engineers,
Per FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Aug. 18, 1905.

Hon. Jno. Dymond, President Board of Commissioners. Lake Borgne Basin Levee District, New Orleans, La.:

DEAR SIR—Your letter of today, referring communication of Mr. W. C. Dotterer, General Manager of the New Orleans Terminal Company, also of this date, to the Board of State Engineers for consideration and advice, is received.

Mr. Dotterer explains, in a general way, that certain changes have been made by his Company in the original plans for the slips in St. Bernard Parish, submitted to your Board as a basis of a contract between it and the New Orleans Terminal Company, for permission to remove the present line of public levee opposite said slips involved in their construction.

One of these changes is the reduction in the depth of excavation required for the concrete walls surrounding the slips from about 45 feet, as originally designed, to 15 feet, as now contemplated, below the general natural surface at the locality, piles to be driven from 50 to 60 feet below this excavation, etc.

In view of this modification, Mr. Dotterer asks, in order to facilitate the work of his Company, to be permitted to excavate the trench for the wall on the up-stream side of the slip now under construction, to within 70 feet of the land edge of the base of the present public levee, instead of 250 feet, as prescribed by the Board of State Engineers when considering the original plans and specifications submitted to it, Mr. Dotterer further guaranteeing that the piling, grillage and concrete wall will be completed long before any rise in the river.

This proposition materially differs from that originally presented in regard to excavations for this work, and involves so much less risk to the interests of your district in its execution that the Board of State Engineers now respectfully submits that it sees no objection to granting the request; provided, that it be clearly understood that the excavation shall not exceed 15 feet in depth, nor a width greater than that required for the width of the wall and necessary operating room; that any excavation outside of the wall be promptly refilled and tamped, and that the permission be expressly understood not to extend to any other excavation contemplated in connection with the work; and provided, further, that you recognize that this connection in no way affects in other respects the status of the contract between your Board and the New Orleans Terminal Company.

The Board of State Engineers would further submit that the recommendations made to your Board on December 13, 1904, were based upon certain plans and specifications then exhibited to it as a basis for its conclusions, and that if changes are being made in these plans and specifications your Board and the Board of State Engineers should be kept fully and clearly advised of them, to avoid conflict between plans and specifications, on the one side, and the recommendations of the Board of State Engineers, on the other, if not the recall of the latter.

Respectfully,

The Board of State Engineers,

Per FRANK M. KERR,

Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Dec. 12, 1905.

Mr. L. S. Berg, President New Orleans Terminal Company, New Orleans, La.:

DEAR SIR—I beg leave to acknowledge receipt this morning of your letter of the 11th inst., in which you state your desire to prepare the lower wall of your slip and bring it to the same distance from the base of the levee as that of the upper wall; that you will protect and prepare said lower wall in an exactly similar manner to that of the upper wall, and request the Board of State Engineers to take immediate action upon the matter.

In answer, I would respectfully state that this permission should be obtained from the Board of Commissioners of the Lake Borgne Basin Levee District directly, and I understand that this Board will meet on next Friday, the 15th inst. In order to expedite matters, however, I have forwarded copies of your letter and of my answer to Hon. John Dymond, President of the Lake Borgne Basin Levee District.

In view of the fact that the modified plans and specifications submitted by your Company have been approved by the Board of State Engineers, and permission has been granted your Company to excavate the trench for the wall on the up-stream side of the slip to within 70 feet of the land edge of the base of the present public levee, as Engineer in Charge of this district I do not see why there should be any objection to the district granting you permission to excavate a similar trench for the lower wall of your slip, under the same conditions as those governing the permission for the upper wall.

Yours truly,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., Jan. 11, 1906.

Hon. John Dymond, Jr., Attorney, Board of Commissioners, Lake Borgne Basin Levee District, New Orleans, La.:

DEAR SIR—Yours of the 5th inst., inclosing two letters from Mr. L. S. Berg, President of the New Orleans Terminal Company,

of the 2nd and 3rd insts., respectively, has been received, and, in deferences to your wishes, Mr. Berg's letters are returned.

I wish to state for your information that I again visited the work of excavating a trench for the lower wall of the slip under construction by the New Orleans Terminal Company in St. Bernard Parish, on Tuesday, the 9th inst., and found that, besides the excavating dredges at work, a pile driver was driving foundation piles across and at the upper end of the trench for the lower wall of the slip, but no sheet piling was being driven, nor any protective work, as was done in the trench excavated for the upper wall of the slip.

It is possible that the plan for excavating the trench for the lower wall of said slip has been changed from the practice pursued in the excavation of the trench for the upper wall; but, if such is the case, this office has no record or plan of said change, nor have the engineers in charge of these works for the New Orleans Terminal Company, as far as my knowledge goes, consulted any member of the Board of State Engineers with regard to the method pursued in excavating this trench.

All that I know is that the trench is not being excavated in accordance with plans submitted to your Board and approved, upon the recommendations of the Board of State Engineers, as addressed to you by letter on August 18, 1905, and as reiterated by me in letter of December 12, 1905, addressed to Mr. L. S. Berg, President of the New Orleans Terminal Company, which was reported to the President of your Board in my letter of December 30, 1905.

I can only report these facts as observed by me, which can be substantiated by your Inspector. As long as the plans and specifications submitted to your Board, and approved by the Board of State Engineers, are not being carried out, conditions there cannot be regarded as satisfactory.

Yours truly,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 20, 1906.

To the Honorable President and Members of the Board of Commissioners for the Lake Borgne Basin Levee District:

GENTLEMEN—For your information, I desire to transmit to your Board a copy of a statement compiled by me on the 2nd inst., to be presented by the Chief State Engineer to the Mississippi River Commission on their recent annual high water inspection trip. This statement contains the approximate elevation of your levees above the high water of 1903, with approximate quantity of earthwork necessary to place said line to a grade 3 feet above high water of 1903, the highest water of record in the district, with crown 8 feet, slopes 3 and 3 to 1; also contains an estimate, based on the same grade, for new levees required in anticipation of future caving banks and the rebuilding of certain stretches of levee deficient in cross-section, which are too near the river bank to be enlarged; also contains a table of the grade of levees as compared with the high water of 1903.

Since the organization of your district, under Act 14 of 1892, the State has expended of the 1 mill tax, as allotted by the Board of State Engineers to your district, the following amounts, viz.:

Year.	Cubic Yards.	Cost.
1893	122,890	$15,361.25
1894	57,543	6,642.02
1895	43,906	5,137.43
1896	53,451	5,345.10
1897	37,975	7,500.00
1898	42,428	5,767.48
1899	33,370	4,849.39
1900	40,841	5,697.31
1901	29,973	4,181.24
1902	30,730	5,787.46
1903	40,287	6,517.99
1904	69,397	12,042,89
1905 (about)	35,000	7,500.00
	637,791	$92,359.56

Or an average of over $7,000 annually.

The amounts expended by the United States Government, from June 30, 1892, to June 30, 1905, are as follows, viz.:

	For Revetment.	For Levees.
June 30, 1892, to June 30, 1893	$2,377.45	$39,150.01
June 30, 1893, to June 30, 1894	3,299.56	32,309.53
June 30, 1894, to June 30, 1895	3,247.83	33,703.57
June 30, 1895, to June 30, 1896	.....	35,252.30
June 30, 1896, to June 30, 1897	.....	5,121.88
June 30, 1897, to June 30, 1898	.....	11,652.14
June 30, 1898, to June 30, 1899	.....	19,244.83
June 30, 1899, to June 30, 1900	.....	25,429.52
June 30, 1900, to June 30, 1901	.....	14,228.62
June 30, 1901, to June 30, 1902	.....	.....
June 30, 1902, to June 30, 1903	.....	9,858.56
June 30, 1903, to June 30, 1904	.....	.....
June 30, 1904, to June 30, 1905	.....	.....
Totals	$8,924.84	$225,950.96

The work done for the above money was the construction of 17,479 linear feet of revetment, and 1,353,548 cubic yards of earthwork.

Your Board has expended on its levees from its organization up to date some $239,409.41.

The floods of 1897 and 1903 have proven that a continued leveeing of the river at its upper end will increase and prolong the flood heights against your embankments, and in anticipation of same it would be wise to gradually increase and enlarge such stretches of levee in your district as have a narrow margin, and are less than one foot above the high water of 1903. Very respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Statement showing approximate elevation of levees above high water of 1903 in the Lake Borgne Basin Levee District, also approximate quantity of earthwork necessary to place said line to a grade 3 feet above high water of 1903, with crown 8 feet, slopes 3 and 3 to 1:

St. Bernard Parish.

Name of Levee.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.	Remarks.
Upper St. Bernard 0-69	6,900	2.5		
Chalmette 69-109	4,000	1.0	20,000	
Port Chalmette 109-169	6,000	2.5	9,000	
Corinne to Story 169-321	15,200	2.5	20,000	
Story to Poydras 321-510	18,900	3.0		
Poydras 510-565	5,500	2.0	16,000	†
	56,500	.....	65,000	

Plaquemines Parish.

Caernarvon 565-578	1,300	0.5	10,000	
578-675	9,700	2.5	10,000	
Kenilworth 675-737	6,200	2.5	10,000	
St. Claire 737-820	8,300	2.5	12,000	
Scarsdale 820-975	15,500	2.5	20,000	
Stella 975-991	1,600	1.5	7,500	
Mary 991-1067	7,600	2.5	10,000	
Promised Land to Greenwood 1067-1119	5,200	1.5	25,000	
Greenwood 1119-1170	5,100	3.0		
Bertrandville to Fanny 1170-1316	14,600	3.0	.....	Under contract by U. S.
Fanny 1316-1354	3,800	2.0	9,000	
1354-1383	2,900	1.5	10,000	
Belair 1383-1428	4,500	2.0	12,000	‡
Belair to Fairview 1428-1490	6,200	2.0	17,000	
Fairview 1490-1610	12,000	3.0	.....	Under contract by U. S.
1610-1627	1,700	1.5	10,000	
1627-1690	6,300	3.0	.....	Under contract by U. S.
1690-1746	5,600	1.5	15,000	
St. Sophie 1746-1805	5,900	2.0	16,000	

Name of Levee.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.	Remarks.
Harlem to Union 1805-1972	16,700	3.0		
Union 1972-2023	5,100	1.5	30,000	
Savoie 2023-2078	5,500	2.0	16,000	
Savoie to Hebert 2078-2196	11,800	1.5	48,000	
Hebert 2196-2210	1,679	3.0	.....	Hebert New Levee 1906.
Louisiana Store & St. Thomas Church 2210-2251	4,100	2.5		
St. Thomas Church to Court House 2251-2286	3,500	1.5	10,000	
Felix Hingle 2286-2301	1,500	2.0	3,200	
Ragas to Martin 2301-2397	9,600	0.5	45,000	§7,500 feet Enlgt.
Martin 2397-2411	1,400	3.0	.....	Martin New Levee 1906.
Bohemia 2411-2535	12,400	2.0	35,000	
Totals	197,279	.....	380,700	

*New levee necessary along this stretch in front of Chalmette Cemetery owing to the caving of river bank.

†New levee necessary along this stretch in front of Poydras Plantation, owing to the caving of river bank.

‡New levee necessary in front of Belair Plantation, owing to the caving of river bank.

§In this line of levee several stretches are too near river bank to be enlarged, and new levees will be required to replace them.

Grade of levees in the Lake Borgne Levee District, compared with high water 1903 (including work under contract):

Parish.	0 to 1′ Above.	1′ to 2′ Above.	2′ to 3′ Above.	3 Feet Above.
St. Bernard	4,000	5,500	28,100	18,900
Plaquemines	10,900	77,200	51,400	57,779
Totals, length	14,900	82,700	79,500	76,679
Percentages	6%	33%	31%	30%

Estimate for new levees required in the Lake Borgne Levee District, based on grade 3 feet above high water 1903, with crown 8 feet, slopes 3 and 3 to 1:

Name of Levee.	Length in Feet.	Cubic Yards.	Remarks.
Chalmette 69-82	1,500	25,500	St. Bernard Parish.
Poydras 507-550	2,500	30,000	St. Bernard Parish.
Belair	1,300	26,000	Plaquemines Parish.
Monsecour 1648-1676	2,800	55,000	Plaquemines Parish.
Lower Pointe a la Hache	6,400	77,000	Plaquemines Parish.
Totals	14,500	213,500	

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

To the Honorable President and Members of the Board of Commissioners for the Grand Prairie Levee District:

GENTLEMEN—For your information, I desire to transmit to your Board a copy of a statement compiled by me, to be presented by the Chief State Engineer to the members of the Mississippi River Commission on their present annual high water inspection trip. This statement contains the approximate elevation of your levees above high water of 1903, with approximate quantity of earthwork necessary to place said line to a grade 3 feet above high water of 1903, the highest water of record in the district, with crown 8 feet, slopes 3 and 3 to 1; also contains an estimate, based on the same grade, for new levees required in anticipation of future caving banks and the rebuilding of certain stretches of levees, deficient in cross-section, which are too near the river bank to be enlarged. It also contains a table of the grades of levees as compared with the high water of 1903.

Since the organization of your district, by Act 24 of 1898, the State has expended the following amounts of the 1 mill tax, as allotted by the Board of State Engineers to your district:

Year.	Cubic Yards.	Cost.
1898	33,097	$3,750.99
1899	29,732	3,964.26
1900	36,519	4,518.94
1901	79,229	10,822.27
1902	40,180	4,999.68
1903	32,870	4,898.37
1904	92,693	10,993.54
1905	40,035	6,272.15
	384,355	$50,220.20

Or an average of over $6,000 annually.

The United States Government has expended in your district the following amounts:

	Earthwork Cubic Yards.	Cost.
June 30, 1899, to June 30, 1900	33,745	$ 4,731.83
June 30, 1900, to June 30, 1901	20,452	2,761.12
June 30, 1901, to June 30, 1902	No work	
June 30, 1902, to June 30, 1903	No work	
June 30, 1903, to June 30, 1904	45,803	8,099.15
June 30, 1904, to June 30, 1905	76,606	13,019.56
	176,606	$28,611.66

From the best information obtainable, your district has expended, from its organization up to date, some $47,265.99.

The floods of 1897 and 1903 have proven that a continued leveeing of the river at its upper end will increase and prolong the flood heights against your embankments, and, in anticipation of same, it would be wise to gradually increase and enlarge such stretches of levee in your district as have a narrow margin and are less than one foot above the high water of 1903.

Very respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Statement showing approximate elevation of levees above high water, 1903, in the Grand Prairie Levee District; also approximate quantity of earthwork necessary to place said line to a grade 3 feet above high water of 1903, with crown 8 feet, slopes 3 and 3 to 1:

Name of Levee.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.	Remarks.
Bohemia to Waltzer 0-115	11,500	2.0	33,000	*
Waltzer 115-131	1,600	1.5	5,000	
Waltzer to Nestor Canal 131-243	11,200	3.0	.....	Under contract by the State; work under way
Nestor Canal to Burton 243-310	6,000	2.0	10,000	
Burton to Edgecomb 310-477	16,700	2.5		
Zettwoch 477-503	2,600	2.0	5,000	
Edgecomb 503-531	2,800	2.5		
Harris 531-584	5,300	2.5	5,000	
Bayou Lamoque to Point Pleasant 584-699	11,500	2.5		
Pt. Pleasant to Nicholls Postoffice 699-789	8,500	0.5	60,000	
Nicholls Postoffice to Jacomini 789-931	15,700	0.5	70,000	
Devils Flat 931-1001	7,057	3.0		
Old Quarantine to Baril 1001-1068	6,550	0.5	24,000	†
Baril to Bick 1068-1110	4,200	0.5	10,000	
Bicks 1110-1122	1,200	0.0	3,000	
Bicks to O'Brien 1122-1138	1,740	0.5	5,500	
O'Brien to Arms 1138-1161	2,300	0.5	7,500	

Name of Levee.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.	Remarks.
Brophy to Fort Reservation 1161-1249	8,800	1.5	25,000	
Fort St. Philip 0-33	3,300	3.0		
Bayou Coubray to New Canal 33-175	14,200	2.0	30,000	
New Canal 175-235	6,000	1.0	20,000	
Below New Canal 235-264	2,900	1.5	10,000	
Lucas Canal New Levee 264-330	6,600	3.0	7,000	
Totals	158,247	.....	330,000	
Extension of system to Bayou Baptiste Collette 330-490	16,000	.....	80,000	New levee.
Bayou Baptiste Collette 490-510	2,000	.....	25,000	New levee.
Total for Extensions ...	18,000	.....	105,000	
Grand totals ...	176,247	.....	435,000	

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Grade of levees in the Grand Prairie Levee District, compared with high water of 1903 (includes work under contract):

	0 to 1′ Above.	1′ to 2′ Above.	2′ to 3′ Above.	3 Feet and over
Plaquemines Parish	53,390	47,600	42,900	21,557
Percentages	32%	29%	25%	14%

Estimate for new levees required in the Grand Prairie Levee District, based on a grade 3 feet above high water of 1903, with crown 8 feet, slopes 3 and 3 to 1:

Name of Levee.	Length in Feet.	Cubic Yards.	Remarks.
Taboney 60-75	1,600	20,000	*
Old Quarantine 1001-1027	2,700	26,500	†
Totals	4,300	46,500	

*New levee necessary at Taboney's, owing to caving of river bank.

†New levee necessary at Old Quarantine, owing to present old levee being honeycombed with crayfish holes at upper end and line of levee at lower end threatened by caving of river bank.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 16, 1906.

To the Honorable President and Members of the Board of Commissioners for the Buras Levee District:

GENTLEMEN—For your information, I desire to transmit to your Board a copy of a statement compiled by me on the 2d inst., to be presented by the Chief State Engineer to the Mississippi River Commission on their recent annual high water inspection trip. This statement contains the approximate elevation of your levees above high water of 1903, with approximate quantity of earthwork necessary to place said line to a grade of three feet above high water of 1903, the highest water of record in the district, with crown 8 feet, slopes 3 and 3 to 1; also contains an estimate, based on the same grade, for new levees required in anticipation of future caving banks, and the rebuilding of certain stretches of levees, deficient in cross section, which are too near the river bank to be enlarged. It also contains a table of the grades of levees as compared with the high water of 1903.

Since the organization of your district under Act 18 of 1894 the State has expended the following amounts of the one-mill tax, as allotted by the Board of State Engineers to your district:

1894	$ 2,479.21
1895	2,563.39
1896	3,079.12
1897	2,942.28
1898	4,454.98
1899	3,867.11
1900	3,139.45
1901	13,233.69
1902	5,439.56
1903	4,776.92
1904	9,875.53
1905	8,000.00
	$63,851.24

Or an average of over $5,000 annually.

The United States Government has expended in your district, from its organization to June 30, 1905, $44,491.29.

Your district has expended, from its organization to date, some $78,541.81.

The floods of 1897 and 1903 have proven that a continued leveeing of the river at its upper end will increase and prolong the flood heights against your embankments, and, in anticipation of same, it would be wise to gradually increase and enlarge such stretches of levee in your district as have a narrow margin and are less than one foot above the high water of 1903.

Very respectfully,

SIDNEY F. LEWIS,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 2, 1906.

Statement showing approximate elevation of levees above high water of 1903 in the Buras Levee District, also approximate quantity of earthwork necessary to place said levee line to a grade 3

feet above high water of 1903, with crown 8 feet, slopes 3 and 3 to 1:

Name of Levee.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.	Remarks.
Point Michel				
3107-3135	2,800	2.0	6,000	
3135-3215	7,800	3.0		
Dr. Hayes to Treadaway				
3213-3308	8,500	1.0	55,000	*
Treadaway				
3308–3330	2,200	2.0	4,500	
Treadaway to Ballay				
3330–3378	4,800	2.0	10,000	
Guyot Settlement				
3378–3477	9,900	3.0		
Abadie				
3477–3489	1,200	3.0		
Guesnard Woods to Orange Farm				
3489–3543	5,400	2.0	12,000	†
Orange Farm				
3543-3559	1,700	3.0	.....	Under contract by State; work not finished.
Orange Farm to Gregory				
3559–3594	3,500	2.0	10,000	
Gregory				
3594-3604	1,000	3.0	.....	Under contract by State; work under way.
Gregory to Kamlah				
3604–3822 ...	21,800	2.0	45,000	
Kamlah to Wenck				
3822–3840 ...	1,800	0.5	10,000	
Wenck to Louderbough				
3840–3903	6,300	1.0	22,000	
Louderbough to Hayes				
3903–3941	3,900	2.0	5,000	
Hayes to Fasterling				
3941–4038	9,700	1.0	35,000	‡
Fasterling				
4038–4054	1,600	2.0	3,500	
Fasterling to Buras Church				
4054–4092	3,800	1–2	20,000	§
Buras Church				
4092–4111	1,856	3.0		
Pelican Store down				
4111–4130	1,900	1.0	10,000	
Rodney				
4130–4218	8,800	2.5		
Smith				
4218–4240	2,200	2.0	6,000	

Name of Levee.	Linear Feet.	Feet Above H. W. 1903.	Cubic Yards.	Remarks.
Bulot 4240–4252	1,800	2.0	5,000	
Leovy 4252-4267	1,500	3.0	.....	**
Schoenberger 4267–4287	2,000	1.5	9,000	
Reddick to upper line of Fort Reservation 4287–4349	6,200	3.0		
Fort Jackson 4349–4445	9,600	3.0		
Fort Jackson to McCormick 4445–4578	13,300	2.5		
McCormick to Jump 4578–4900	32,200	1.5	65,000	Lower Buras.
Totals	179,056	.....	433,000	

*In this line of levee there are several stretches which are too near river bank to be enlarged to standard section, and therefore levee will have to be moved back sufficiently far for pit room, as this bank is rmanent.

†New levee will be required at Guesnard Wood.

‡In this line of levee there are several stretches which are too near river bank to be enlarged to standard section, and therefore levee will have to be moved back.

§Involves also rectification of line.

**Caving bank; new levee necessary.

Grade of levees in the Buras Levee District, compared with high water, 1903 (includes work under contract):

	0 to 1′ Above.	1′ to 2′ Above.	2′ to 3′ Above.	3 Feet Above.
Lower Plaquemines Parish...	28,200	91,000	45,500	14,256
Percentages	16%	51%	25%	8%

Estimate for new levees required in the Buras Levee District, based on grade 3 feet above high water, 1903, with crown 8 feet, slopes 3 and 3 to 1:

Name of Levee.	Length in Feet.	Cubic Yards.
Nairn	1,500	18,000
Hayes to Moizant—3942–3952.	1,300	16,000
Clinton to Fasterling 4003–4038	3,900	47,000
Mrs. Bulot—4242–4252	1,200	12,000
	7,900	93,000

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 8, 1904.

Hon. J. M. Robinson, President, and Members Caddo Levee Board:

GENTLEMEN—I beg leave to report that a thorough inspection of the levee lines in your district, made since the high water in Red River, revealed conditions to be as follows:

Commencing at the southern or lower end of the district, the first portion of the levee system immediately affected by caving banks is at Cross Keys, where the caving has reached to within 110 feet of the centre of the levee, and as there is every indication of the continuance of caving, a new levee is necessary there.

At Magnolia Plantation the levee is threatened by caving which has reached within 160 feet of the centre, rendering a new levee necessary.

The Loggie Lea new levee, which was constructed last season, has grown up in weeds, which should be removed so as to give the grass a chance to live.

Caving has reached to within about 250 feet at the Brown Place, and unless the next high water acts differently a new levee will probably be necessary there.

I am glad to report that conditions are such that no new levee will be required this season at Musser's, where it was feared a new levee would be necessary.

At Robson's Long Point Plantation, however, caving has reached to within 65 feet of the centre of the levee, and a new levee is necessary there this season.

At Riverdale caving has reached to within 133 feet of the centre of the levee, rendering a new levee necessary.

At Dixie Plantation the levee is threatened and only 100 feet separates the river from the centre of the levee, so a new levee is imperative there. Another short piece of levee may also be necessary about one mile above where the caving has reached within 225 feet.

Above Shreveport, the first place requiring consideration is at Pickett, where the river is quite near the levee still, but where not much change has occurred since last year. As the Texas and Pacific Railroad Company has assumed responsibility for this piece of levee no recommendation is necessary at this time.

At Sterling Bayou a new levee is necessary, as only 73 feet remains between the centre of the levee and the river.

At Elmer, or Gardner's, a new levee is necessary, as caving has reached to within 138 feet of the centre of the levee.

There are three places between the Sterling Bayou and the Elmer levees where the river is getting uncomfortably near the levee, due to caving, and where new levees may be necessary soon, namely, Rush Point, Jim Dixon's, Wood Place and Cedar Bluff.

The Wild Lucia new levee is entirely obscured by weeds and should be cleared and good grass planted without delay. The Elmer new levee, built last year, is also covered with a heavy growth of weeds, which should be removed.

At Thompson's and also at Missionary caving is threatening to require new levees soon, but the construction of same can be deferred at present.

The Board of State Engineers has found it expedient at this time to undertake the construction of the Gardner or Elmer new levee and also the Sterling Bayou new levee, which are respectively 3 feet and 2,895 feet long, and contain respectively about 60,000 and 30,000 cubic yards of earth, and to that end are now advertising for bids upon same, to be opened on August 17. As none of the other places in your upper district require immediate attention, this will enable your Honorable Board to devote what revenue you can control to necessary work in the lower system. Of course, the most important of this work is that near the upper end of the lower system. So I recommend that you undertake, as soon as possible, the construction of the new levees at Dixie and Riverdale, which are respectively 2,905 feet and 2,535 feet long and contain about 52,000 and 47,000 cubic yards respectively, and also that you do such clearing off of weeds and planting of grass as are reported above as being necessary.

You will notice that I have made no mention of such raising and enlargement as may be necessary, and which Major F. M. Kerr has already recommended in previous reports.

The Board of State Engineers expects to be able, later on, to construct a good portion of the other new levees mentioned as necessary this season, and will later on undertake as much as they can. In the meantime, should it become necessary for your Board to undertake some of the balance, that could be considered later.

Respectfully submitted,

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 1, 1905.

Hon W. V. Robson, President Caddo Levee Board, Shreveport, La.:

DEAR SIR—Colonel Kerr and I have just returned from an inspection trip on Red River, during which we traveled over the Caddo levees from Sterling Bayou to Burney Means' Missionary Place near the Arkansas line and I made memoranda of such conditions as presented themselves which might be of interest to you and the members of the Caddo Levee Board.

The first point where anything was found worthy of note was at Rush Point, where the gin house is on the brink of the river and the bank is caving to such an extent that it may be necessary in the near future to construct a new levee there.

A heavy rain assisted in showing up a number of big holes or low places in the public road immediately back of the levee all along the Briarfield front. I have noticed these holes before and think that something ought to be done toward draining them, as they are a menace to the safety of the levee.

At Mr. Jimmy Dickson's Wood Place the river has caved to within 175 feet of the first angle above the residence, and a new levee may also be necessary there if the caving continues.

By far the worst conditions existing anywhere in the Caddo levee district were found at Cedar Bluff, where I believe the attention of the Board has long since been directed, in regard to the growth of forestry which has taken possession of the levee. The forest is decidedly on the increase and many of the trees are now one foot in diameter, the levee is completely obscured and covered by them, and any one, even the veriest amateur, who happened along, could not believe that this is a part of the levee system, as it looks as if it had been abandoned to the action of nature for at least eight or ten years. If you will remember, a part of this levee is so close to the river that Colonel Kerr had recommended a new levee across the point several years ago, but for lack of funds or other reasons this levee has never been constructed, and I suppose that is the reason why this levee has never been cleaned off. At any rate, the portion to be covered by a new levee is but a small portion of what is covered with forestry. There is at least one mile on the Cedar Bluff and Crescent Plantation which would not be thrown out by the new levee but which is in just as

bad a condition as any part of the point. There can be no doubt about this mile of levee forming a part of the main levee system for many years to come, and I feel sure that should you or any of the members of the Board see this levee, or have it pointed out to you, you would probably feel ashamed to acknowledge that it was in your care. I bring this point out rather more strongly probably than I should, but I do so because you are, no doubt, unaware of its real condition.

The Wild Lucia Levee, which is just below and adjoining the Crescent Levee, and which was only built last year, is also covered with a very rank growth of immense weeds which have nearly exterminated the grass, and even though they are now dead they have taken complete possession of the levee and must be cleaned off in order to save the levee from ruination by rain wash. Just above the upper end of the Wild Lucia new levee, which is just immediately below Glycerine Bayou, the caving has reached so near the levee that a new levee may be necessary there next year.

From Egypt to Coushatta Bayou, which includes the Peru Levee, no slashing of the trees on either side for 100 feet was ever done, and the levee is covered by a rank growth of weeds, briars, etc., and just as soon as you can afford to do so the slashing should be done and the levee cleared. There are a number of trees now fallen across the levee and more will fall unless the slashing is done.

The Elmer new levee is badly grown up in weeds which must be removed or it will be ruined by rain wash. I expect this levee has been worse hog rooted than any levee in your district for many years. It is in a fearful condition. There is a ramp near Red Bayou which crosses the levee where they are hauling a great many heavy logs. This ramp is insufficient and the levee is suffering in consequence.

At Simpson Lake the enlargement is now covered with weeds and it should be cleaned off and well grassed.

The Missionary Levee is badly rooted by hogs, but Mr. Burney Means was at work repairing the levee when we passed there.

With the exception of the defects above mentioned, the levee system in the upper Caddo district is in a splendid condition. In fact, it looks so well that the defects are brought out all the more strongly.

I received a letter from Mr. H. R. Coupples at Bagley telling me that the caving which Mr. Charlie Martin spoke of at the upper end of the new Riverdale Levee has not approached nearer than

80 yards to the base of the old levee. I will inspect this point some time during this or next week, when I expect to be in that neighborhood.

Sincerely yours,

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 29, 1905.

Hon. W. V. Robson, President Board of Commissioners, Caddo Levee District, care Mr. S. N. Kerley, Shreveport, La.:

DEAR SIR—Assistant State Engineer Gervais Lombard left here last Tuesday for the Red River and Bayou des Glaizes Levee and Drainage District, expecting to return here by today. I am, however, this morning, in receipt of a telegram from him, from Alexandria, stating that, owing to the restrictions placed upon travel throughout the State by the very general quarantine measures in force, he will not reach New Orleans before tomorrow night, too late to enable him to prepare and forward the report to you in time for your meeting on August 2 next, requested at the meeting of your board on June 21 last, and, therefore, asking me to do so for him, his notes and memoranda being at hand.

I, therefore, beg leave to report as follows: In compliance with your wishes, as expressed at the meeting of your Board on June 21 last, the Board of State Engineers has, through Mr. Lombard and myself, made an inspection of the lines of public levee in your district, with the view of advising you in regard to the localities at which levee work will be needed in the district, during the approaching season of construction, with approximate estimate of contents, etc.

The localities at which levee work may be required this season are at Bargetown, Red Bayou, Cedar Bluff, Wood Place, Rush Point and at Pickett's, above Shreveport; and at Shreve's Island, Long Branch, Long Point, Woodlawn, White Hall, Cross Keys and at the Beaird and Bonner Place, below Shreveport.

Conditions at these localities, however, permit the division of the works named into two classes; the first, work of immediate necessity, and, second, work of secondary importance which may await further developments.

The works of immediate necessity are the Red Bayou Levee, containing about 40,000 cubic yards of earthwork; Cedar Bluff Levee, about 40,000 cubic yards; Rush Point Levee, about 35,000 cubic yards; Shreve's Island Levee, about 40,000 cubic yards; Long Branch Levee, about 15,000 cubic yards, and Long Point Levee, about 50,000 cubic yards; a total of about 220,000 cubic yards.

The works of secondary importance are at Bargetown, Wood Place, Pickett's, Woodlawn, White Hall and at the Beaird and Bonner Place, the yardage for which cannot be stated until later developments, though, to simply tide over another season or so, it may be stated that some may possibly be deferred and that there is reason to believe that the yardage on the others may be inconsiderable as compared to that required for the works of immediate necessity before named.

Of the works of immediate necessity, the Board of State Engineers is pleased to say that the State will be able to undertake the construction of the Red Bayou, Cedar Bluff and Rush Point Levees, amounting to about 115,000 cubic yards, leaving the district at this time to provide for only the Shreve's Island, Long Branch and Long Point Levees, amounting to about 105,000 cubic yards.

The Board of State Engineers will, therefore, with your concurrence, recommend to His Excellency, Governor Newton C. Blanchard, that the State undertake the Red Bayou, Cedar Bluff and Rush Point Levees, and upon his approval promptly advertise the same for construction; and the Board, herein, respectfully recommends to your Board that it promptly make provision for the construction of the Shreve's Island, Long Point and Long Branch Levees.

Please advise us at your earliest convenience of the results of your deliberations and greatly oblige,

Yours very truly,
The Board of State Engineers,
Per FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 21, 1906.

To the Board of Commissioners, Caddo Levee District, Shreveport, La.:

GENTLEMEN—On the 6th, 7th and 8th of this month I made an inspection of the levees in your district, commencing at the upper end of the system above Shreveport.

I found that the first place needing attention was at Mr. W. B. Means' Missionary Plantation, where caving has reached within a few feet of the levee for a distance of 1,000 feet or more. In anticipation of this condition the State, on November 23, 1905, let a contract to Mr. Mike Hunt for the construction of a new levee at this point, to be completed March 1, 1906. It was explained to the Board of State Engineers, at the time, that Mr. Mike Hunt had bid in this work for account of Mr. Means and others, who were to construct the levee under the terms and conditions of the contract, and to this end a force of forty teams was to be employed; but owing to bad weather this force was never entirely organized, and such force as was secured became demoralized and accomplished very little indeed. Some three weeks ago, Mr. Mike Hunt moved his own outfit of twelve wheel scrapers on the work, and the former force, which was mainly composed of farming stock, was promptly withdrawn. Only about 15,000 cubic yards had been put in position on March 7, so Mr. Hunt was notified to increase his force without delay. This levee must be completed before the first week in May, when the spring freshets may be expected, as the present levee will not stand another rise.

Caving of a serious nature has reached to within 200 feet of the big Rattling Slough Levee, which is located about one and one-half miles above Red Bayou. Should this caving continue, a new levee some 3,000 feet or more long, and about 16 feet in average height, will be necessary. Such a new levee will require between 115,000 and 125,000 cubic yards of earth.

I noticed that considerable caving had taken place at the upper end of the new Elmer Levee of 1904, which may necessitate the construction of a new levee there this fall, if the caving continues. The Elmer Levee is badly hog rooted.

A part of the Gardner Levee, which was built last year, is still badly rain-washed, but as the grass has begun to spread it is not

likely to wash much more. However, this rain-wash should be restored at the present time, as it is now the season which is best suited for the early and thorough grassing of the levee.

Just below the middle of the West Egypt Place a stump hole has developed at the land toe of the levee which should be repaired.

About 1,500 feet above the upper end of the Wild Lucia new levee of 1903-4, caving has reached to within 130 feet of the centre of the levee, but, as the bend is not abrupt, caving is not apt to be rapid. However, a new levee may be necessary there this season. The Wild Lucia new levee has been considerably hog rooted. The same must be said of the levee on the lower Cedar Bluff front. I did not inspect the levee from Mr. Sentell's ferry down to Pickett's Station.

Below Shreveport I found, on March 8, that a small force was making good progress on the Shreve's Island new levee. Caving had breached the old levee and reached within 150 feet of the railroad track, and the Texas & Pacific Company were at work sinking mattresses of willow brush in the hope of arresting further caving.

Opposite Dixie Station only 210 feet remains between the centre of the levee and the river bank, which is caving rapidly. A new levee will no doubt be necessary soon.

From Dixie Station on down to the lower end of the system the levee has been for the most part badly hog rooted, and in many places the top of the levee has been entirely removed by the hogs. It would pay to employ an official hog killer every season between the time the crops are harvested and replanted, as the hogs seem to be invariably turned out of their pens during this time, and the absence of such an official has a bad moral effect.

At Long Branch not much change had taken place, and no work has been done upon the new levee for which the State let a contract on November 6, although the contract time for completing this levee was January 1, 1906. I am informed, however, that the force which is now completing the Long Point new levee will start work upon the Long Branch Levee as soon as it finishes the Long Point Levee.

Not much change has taken place at the Brown Place, where the State also let a contract for a new levee. No work has been started upon this levee, although under the terms of the contract it was required to be completed by February 1, 1906.

At Logie Lea, just above Mr. Moss' residence, rapid caving has taken place and only 130 feet was found between the centre of the levee and the river bank. A new levee seems certain here in the near future.

At White Hall rapid caving has almost reached the levee, and a new levee will be required there this season.

The Campo Bello new levee of 1903-4 is again threatened by caving which has reached to within 235 feet of the centre of the levee just opposite the little colored church.

From there on down to the lower end of the parish, however, the levee line is in good condition, and is not apt to need any new levees this season.

Respectfully submitted,

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
SHREVEPORT, LA., July 7, 1904.

To the President and Members Bossier Levee Board:

GENTLEMEN—On yesterday Major Kerr and I made an inspection of the levee from Sunflower to Cash's Point, and found that the recent high water had made considerable change in the bank-lines. Mr. Moss had written that a run-round was found necessary at Sunflower and we found that, where on March 24 last there had been a distance of 250 feet from the centre of the levee to the edge of the bank, there is now only about 30 feet, and the river slope of the levee has been reached. About half a mile below this point on lower Sunflower there is only about 85 feet from the centre of the levee to the edge of the bank. This would represent a loss at this point of about 25 feet since last March, and while the bank here is more of a washing bank than a caving bank, a new levee will soon be necessary. I recommend that bids for building a new levee at upper Sunflower be invited without delay.

The Alexander-Blanchard levee is obscured by an unusual growth of weeds, briars and trees, but a close examination revealed that said levee had also been cut up badly in the past by hogs, and is being materially encroached upon by wagons and vehicles, which have cut a good part of the land slope of the levee away. We further found that this levee was being enclosed with

a fence, the posts of which are being placed well upon the land slope, instead of say three feet from the land toe. I recommend that the levee from Mack's Bayou to Belcher's be cleared and repaired, restoring all cuts and low or worn places.

At Belcher, near to upper end of the place, the caving has reached to within 165 feet of the centre of the levee and I recommend that the Vinson Bayou Levee be extended down stream about 1,500 feet, to cover this threatened point. We found the levee overgrown with weeds from about half a mile above Kobler's Mill to the Pat Cash's new levee.

At Gilmer's Lane caving has reached to within 85 feet of the centre of the levee and I recommend that a new levee be constructed there without delay, as this is a badly caving point.

At McVey or Cash's Point we found a most unusual amount of caving had occurred and at least 1,000 feet of the levee had caved into the river. The caving reached straight back at least 1,000 feet during the last few weeks. A new levee is necessary, of course, and I recommend that you advertise at once for bids on this levee. The balance of the levee line in this point is obscured by weeds and should be cleared as soon as possible.

At Pat Cash's Place the levee has also caved into the river, but as this is a very high point and I understand that Mr. Cash usually constructs such run-arounds there as may be necessary, I recommend that you defer action for the present upon this work, until you can learn what Mr. Cash is willing to do in the matter. Should Mr. Cash fail to build a run-around, I recommend that you construct a new levee there on a safe and permanent location.

Of the above work the Sunflower Levee, 4,000 feet long, requiring the emplacement of about 60,000 cubic yards, the Gilmer Lane Levee, about 4,000 feet long, containing about 60,000 cubic yards, and the McVey Levee, 3,000 feet long, requiring 40,000 cubic yards, should be advertised at once so as to open bids by the first week in next month. These levees are absolutely necessary, and work will go cheaper now than later on, and as they will require, say, 160,000 cubic yards, there is no time to lose.

I beg leave to call your attention to the fact that in many places there is no way to reach the levees for inspection, except on foot, owing to the public road and the levee both being fenced off by private parties, and I therefore recommend that suitable resolutions be adopted by your Board, requesting that parties having

placed such obstructions remove same or provide means for the proper inspection by members of your Board, inspectors and engineers on horseback or by means of vehicles. Neither Major Kerr nor I have yet had an opportunity to inspect any part of the balance of your levee line since the recent high water, but, judging from the changes which have occurred during that time along the part of the district which we have inspected, I fully expect to find serious changes at a number of points in the balance of the district, although we have not so far been informed of any such changes. However, I will go over the entire line in person, very soon, and expect to be able to further advise you in the matter, at your next meeting, which I presume, in the light of the above recommendations, will be held the first Thursday in August.

Respectfully submitted,

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., March 31, 1905.

Hon. W. T. Colquitt, President of the Bossier Levee Board, Bossier City, La.:

DEAR SIR—Colonel Kerr and I have just returned from an inspection of the levees on Red River. We only went over that portion of the Bossier Levee District levees from Bossier City up to Hurricane Bluff, but from the condition of this portion of the levee line it is only natural to suppose that similar conditions exist from Bossier City down.

The first serious infringement of the levee laws that we noticed was right in Bossier City, where we found that a railroad track had been placed on top of the levee and the entire levee changed in shape, etc. The Board of State Engineers was not made aware of any such intention on the part of the railroad company to place its tracks there, and, although a contract was entered into between the Bossier Levee Board and a certain saw mill at one time, by which the railroad track was permitted to be placed on top of the levee for a certain given distance above the bridge at Bossier City, this new extension of the track does not come under said contract and was done without the approval of the Board of State Engineers, which is absolutely necessary under the law

before any such work can be done. (See Article 239 of the Constitution of 1898.) The saw mill and railroad company should be enjoined from using this track and should be made to pay such fines as are provided in the law, and also such damages as may be proven to have been done.

The levee just above where the railroad track has been placed has been hog rooted and a cut for a road crossing made through the levee, which is in violation of the law. The saw mill people have also dumped a lot of lumber and material on the levee and they should be made to remove that without delay, and should also be made to understand that the levee cannot be used for any such purpose. I noticed also that all of the trash, thorn trees, weeds, etc., which have been cleared out of the field just above the saw mill have been thrown over the fence and on to the levee, where they are a menace to the proper maintenance and condition of the levee. A new line of telephone poles has also been placed on the river slope, where they have no right to be and where they are a menace to the security of the levee.

I believe I have mentioned to you already a deep cut or cow path through the levee near the upper end of the Dillard Place and as it is isolated it would be well to have this repaired and to prevent cattle, etc., from crossing there.

At Mr. F. M. Crow's store a feed trough for cattle has been placed on the crown of the levee where cattle will stand around it and wear the levee away. The levee is also badly worn in two places near there and should be repaired. I believe that Colonel Kerr has already reported a majority of these cuts and worn places in the Bossier Levee system, but it would be well, no doubt, for me to enumerate them again, as many of them are in such condition as to warrant their being attended to without delay.

Barrett has two crossings where the levee is deeply worn. The Gilmer Lane new levee has been very badly washed and the grassing destroyed. The work entailed in reparing these washes and restoring the crossings is such that it should be done either by contract for a lump sum price, or by an outfit which can be hired by the day and some reliable man put in charge of it. Of course, you understand that this is the very best season of the year in which to do such work, as the grass will now grow and before fall will spread so as to prevent the fresh earth from being washed.

At Pandora, on the Bryant Place, near the barns and stable yard, the levee is in a disgraceful condition due to hog rooting and

the constant traveling and presence of cattle, keeping the grass from growing and allowing the levee to be washed away by rains.

At Benoit Bayou the dike has been fenced in, the fence being placed on top and across the same in such way as to be in violation of the law. This bayou is badly overgrown with saplings and weeds on the land slope and should be cleaned and the fences removed to the toe of the slope on either side.

The Cash Point new levee is in the same condition as the Gilmer Lane new levee and should by all means be repaired at once. I notice that the contractor failed to cut the back end of the traverses along the pit. This could be done in getting earth for repairs.

The levee at Gordy Ogden's place seems to be regularly used as a wagon road and is badly cut up, which is a gross violation of the law and should be stopped immediately before greater damage is done.

I noticed that the bank is still caving at Honey Grove, where only about 225 feet is left between the levee and the river, and it may be necessary in the near future to build a new levee there.

Mr. Stinson has several bad crossings through the levee on his place, and the new Rough and Ready Levee, which has just been built at so great a cost, is also being used as a wagon road and some of the ruts on top of this levee are actually hub deep. The same thing is noticed all along the top of the levee from Rough and Ready up to and along the Lassiter Place, and notice should be served on the parties using these levees as roadways that they are violating the State laws and that they will be prosecuted if found on the levees again. Besides being traveled upon by vehicles the Lassiter Levee has been dangerously rooted by hogs in many places, the crown having been entirely removed and all of the grass and a great part of the earth dug up and worn away. The Lassiter Levee is also badly overgrown with weeds and briars and should be cleared.

I have failed to mention the fact that no levee has been built on Mr. Pat Cash's Place, where I reported nearly a year ago that his levee had caved into the river. There is no danger at this point, however, as the land is extremely high and not much water could ever come against the levee there. Besides, I believe Mr. Cash stated that he would build whatever run-around or levee may prove to be necessary there.

I will try to inspect that portion of the levee system below Bossier City within the coming month; but, as I reported once before

to the Board, the levee is fenced off to such an extent that the only possible way to get through is to cut the wire fences. I dislike to do this very much as the parties owning these fences seem to resent my doing so, but in reality they have no right under the law to place any such obstructions in the way of a proper inspection of the levee; in fact, they have no right to put any fences on the levee at all; but, as you know, we would rather see the levees pastured than to be allowed to grow up in weeds. I would be glad to make an appointment with you and the rest of the Board to make such an inspection at an early date, so that you could see for yourself not only the difficulty of inspecting, but also the condition of the levees, due to the neglect or depredations by parties who do not realize the importance of maintaining the levees to their highest efficiency.

I believe that the matters which are herein called to your attention are of such importance as to justify your calling a meeting of the Board, unless you feel that you are justified in taking the necessary steps to repair the levees as above recommended, particularly the Gilmer Lane and the Cash Point Levees, which are in a serious condition due to rain wash. With regards, I am,

Very truly yours,

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., May 30, 1905.

Hon. W. T. Colquitt, President Board of Commissioners, Bossier Levee District, Bossier City, La.:

DEAR SIR—I have the honor to inclose for your information copy of report of Assistant State Engineer Gervais Lombard, relative to the request contained in the resolution passed by your Board on the 25th inst., in regard to cut-offs at Fire Point, Caldwell Point and Staten-Peace Point, on Red River, the result of his inspection of the localities, his views, recommendations, etc.

In compliance with the request of your Board, the matter, with Mr. Lombard's report, was taken up by the members of the Board of State Engineers present here today, namely, Messrs. Sidney F. Lewis, Arsene Perrilliat, Gervais Lombard and myself, and, in accordance with their wishes, I beg leave to herein inform you of the result of their deliberations, as follows:

It is the unreserved opinion of the Board of State Engineers that the forcing of cut-offs in any stream is to be condemned on principle, that the practice tends without question to the violent disturbance of its regimen to such an extent as to make navigation at times unsafe, and caving banks so general, as to seriously operate against the stability of its banks and the maintenance of any comprehensive levee system along the same. Instead of assisting in the development of cut-offs, in the opinion of the Board of State Engineers, measures should, wherever possible and practicable, be, on the contrary, instituted to prevent them.

One of the greatest difficulties to contend against in Red River, in the improvement of its channel, and in the maintenance of its banks and the levees mostly paralleling them, is the irregularity and steepness of its slope. Every cut-off that occurs or is forced further steepens the slope, and aggravates caving, not only at and opposite the cut-offs, but for many miles above and below, to the injury of localities which might not otherwise be affected.

The Board of State Engineers, therefore, on general principles, condemns the practice, and, herein, reports unfavorably upon the cut-offs at Fire Point, Caldwell Point and Staten-Peace Point, in regard to which your resolution directly calls for an expression of opinion from the Board of State Engineers.

Furthermore, the Board of State Engineers wishes to advise you that the forcing of cut-offs by anybody, or parties, or individuals, is in direct violation of the laws of the General Government, regulating the control of navigable streams, which make it a crime punishable by heavy fine and imprisonment to interfere in any way whatsoever with the course or direction of such a stream, without the authority of the Secretary of War of the United States.

Respectfully submitted,

The Board of State Engineers,

Per FRANK M. KERR,

Chief State Engineer

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., May 30, 1905.

Colonel F. M. Kerr, Chief State Engineer, and Fellow Members of the Board of State Engineers, New Orleans, La.:

GENTLEMEN—Having been requested on the 25th inst., by the Bossier Levee Board in special meeting assembled, through resolu-

tion, to make an examination of Fire Point, Caldwell's Point, and Staten-Peace's Point, with the view of ascertaining the facts in regard to conditions prevailing which would bear upon cut-offs occurring or being made across said points, and to have the Board of State Engineers to weigh the facts in the case and make report upon the advisability and practicability of causing these cut-offs, I hereby report that I have examined each of said points and found the following conditions:

Opposite Fire Point the river had caved back gradually until the levees have been forced back to very low ground and are now threatened by caving and further removal to still lower ground at great cost to the Levee Board, and loss to the owners of the property. A cut-off would relieve the situation just complained of. The Bossier Levee Board owns Fire Point, but should a cut-off be made there is no doubt that other adjacent property will be involved, due to the increased velocity of the current after the cut-off and consequent caving. The levees on the Caddo side would also be seriously involved. The narrowest place across Fire Point is about 1,650 feet, and the land there is high, and, from report of parties on the ground, probably underlaid by a stratum of hard earth or clay, which would not wash. The extent of this stratum could be determined only by borings. At any rate it would require a very large channel to start a cut-off there.

At Caldwell's Point I found the land submerged partly and could not measure across the narrowest place. I could plainly see across the entire point, however, and estimate that it would require a large channel about 2,000 feet long to effect a cut-off. The levees opposite this point are not very large and accelerated caving would surely involve the rest of the levee systems on both sides of the river for several miles above and below the proposed cut-off.

At Staten-Peace Point the total distance across the narrowest point is fully a mile and a quarter, and would have to traverse two arms of old river, and I doubt if a cut-off could be effected at any reasonable cost or within a reasonable time. Besides, such a cut-off would threaten the great dike across Tones Bayou. In this instance the Scopini Levee, which is opposite the point, is a large levee, and, like the Stinson Levee, is threatened by caving. The cut-offs could not be effected in time to give any relief during the present flood stage, and it is my conviction that it would be cheaper to construct more levees further back at the threatened places than to make the cut-offs, with their resultant disturbances and damage.

Respectfully submitted for your consideration and report to the Bossier Levee Board.

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 4, 1906.

To the Honorable President and Members, Board of Commissioners, Bossier Levee District, Bossier City, La.:

GENTLEMEN—During the past month I made an inspection of the levees in your district, and I am pleased to report that conditions, in respect to caving banks which might reach the levee line, are more promising this season than they were at this time last year.

The only places which looked threatening are at Chalk Level and at Pruitt's. No further caving has taken place at Arnold and it now seems that the levee there will stand for a while longer.

On March 21 I again inspected the situation at the Pruitt Place, near Sunny Point, and found that what change had taken place there was for the better. The caving on the opposite point was still progressing, and this has resulted in the shifting further down stream of the point of attack on the Bossier side. It would now seem that a new levee half the length of that originally proposed will suffice, and that perhaps no new levee at all will be necessary this season.

Commencing at the upper end of the system, at Hurricane Bluff, I found that gradual caving is still progressing opposite the Willow Bend Levee, but the batture is still wide enough to stand for a season or two.

From the Lizzie Dickson residence down to the Lassiter residence the levee is not pastured, except by hogs, which have rooted the levee seriously. The weeds take possession of this part of the levee line every year, and I notice that it is not until the latter part of winter that they are removed by burning.

I notice that from the Lassiter residence on down to the Stinson residence the top of the levee has been constantly used as a roadway and that this serious abuse has greatly affected the condition of the levee, the top of which has been denuded, deeply rooted and worn down, until it is no longer at proper grade above the high

water plane, all of which is in flagrant violation of laws governing the protection of the levees, and your Honorable Board should take radical steps to suppress this and other abuses to the levee system, which system is so vitally necessary for the protection of the district from overflow, and the construction of which has been achieved at so great a cost.

From the Stinson residence on down to Gold Point it is impossible to inspect the levee, except on foot, as the levee, road and batture have been sewed up with wire fences through which no openings have been provided, and one has to drive many miles into the interior to circumvent them. As far as could be seen, this part of the line was in good condition.

I found that at Gold Point the private levee protecting the point had been divorced from the line of public levee some 800 feet or more and was nearly completed. I staked off a spur connecting the two systems, which should be constructed by your Board without delay, as a rise of sufficient height to flow across the point between the two systems would endanger the main line of levee on the lower side of the point, where it was threatened during the high water of last June. This spur will contain about 7,300 cubic yards.

The new levee at Colquitt Point has at last been started, and when inspected fair progress was being made.

No levee has yet been built on the Pat Cash Place, where the levee caved into the river about two years ago. The river seldom gets out of its banks there, however.

At numerous places where the grass has been skinned off the levees by paths, road and cattle crossings, the rain has washed the levee down and such places should be repaired wherever they occur, as they form weak places in an otherwise strong and effective levee system.

On March 6 I met Mr. A. A. Woods, resident engineer of the V. S. and P. R. R., at Bossier City, and we inspected that part of the levee line which is occupied by their railroad tracks. Mr. Woods understood his company would proceed without delay to carry out the requirements mentioned. On March 21 nothing had been done by the railroad company toward rectifying conditions existing at the new Cotton Belt bridge.

The new levee at Belcher Place has been completed and is in good condition.

At Schenick's Bayou, on Mr. Fullilove's Chalk Level Place, con-

siderable caving has occurred, and it begins to look as though a new levee will shortly be required there.

From Mr. Fullilove's residence down for a number of miles to the Curtis store the levee and road are fenced off, so that no inspection is practicable except by driving around each cross fence back to the railroad track a mile or two into the interior. Proper openings should be required.

I noticed that the tops of the levee along the Nicholson front was being used as a roadway. The Sunflower new levee of last year is badly worn, and the upper end very weedy. The batture in front of the levee caved during the past season about 400 feet. The close place at lower Sunflower has not changed, although indications are that caving will render a new levee necessary there.

Considerable hog rooting was noticed from here on down, especially on the Pruitt Place, where serious damage has been done.

The new Scopini levee, which was recently finished, is in good condition. The caving there has moved down stream and is now opposite the levee constructed several years ago by the convicts, where there is still considerable margin.

The new levee at China Grove-Christiana has not yet been completed, although a force is now at work there, which should complete the work within the next week or ten days, weather permitting.

The contractor at work on the Bear Point new levee has made pretty good progress and with fair weather should complete the levee within the next thirty days.

Respectfully submitted,

GERVAIS LOMBARD,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 9, 1904.

To the Honorable President and Members of the Board of Commissioners of the Red River and Bayou des Glaizes Levee and Drainage District, Marksville, La.:

DEAR SIRS—In compliance with your request, the Board of State Engineers has the honor to submit the following report outlining a general project for your guidance in carrying out the requirements of the law charging your Board with the duty of constructing and maintaining a comprehensive levee and drainage system for

he protection and improvement of the Red River and Bayou des Glaizes Levee and Drainage District.

The territory subject to the operations of the act of incorporation of your district—No. 109 of the General Assembly of 1904, approved July 4, 1904—is described as "all the territory in Avoyelles Parish, consisting of the alluvial lands subject to overflow, bounded by Red River, the Atchafalaya River, Bayou des Glaizes and the public road running from David's Ferry, on Red River, to Bayou des Glaizes, by way of Marksville, Mansura and the 'Long Bridge' at Bout du Bayou."

The perimeter of this territory is about 135 miles, and its area about 183,000 acres, of which 170,000 acres may be classed as vial land subject to overflow.

In their proper ord e nd importance the levees required to protect the d flow from the Red River, Atchafalaya River and Bayou come first, drainage, dependent upon developme n

To protect the dist v from Red River, the Atchafa va River and wo propositions present them- for consider of State Engineers, one of ien, however, involve ing of a levee across Bayou des Glaizes, to do which the law recites "they shall not have the authority," etc.

The first proposition would call for the construction of a line of levee down the right bank of Red River from a point at or near David's Ferry to the head of the Atchafalaya River, thence down the right bank of the Atchafalaya River to a point near the mouth of Bayou des Glaizes, thence up the left descending bank of Bayou des Glaizes to a point at or near the "Long Bridge" and thence along a line parallel to the public road, described in the act of organization, to the high ground known as the Avoyelles Prairies, which might be so located as not to greatly, if at all, exceed about 112 miles in length. This line of levee may be estimated to contain not less than 5,000,000 cubic yards of earthwork, that is, about 3,500,000 on the Red and Atchafalaya Rivers and about 1,500,000 cubic yards on Bayou des Glaizes and across the bottoms to the Avoyelles Prairies.

The erection and maintenance of such an unbroken line of levee from the Avoyelles Prairies at David's Ferry, on Red River, to the Avoyelles Prairies at the "Long Bridge," on Bayou des Glaizes,

completely enclosing the district, could result in but one ultimate effect, namely, the partial if not total overflow, at times, of the district from rain water, from which relief could be had only by means of large and expensive pumping plants, judiciously located.

The second proposition would include the construction of the line of levee described in the first, from David's Ferry to the mouth of the Bayou des Glaizes (3,500,000 cubic yards), and, by and with the consent and co-operation of the Red River, Atchafalaya and Bayou Bœuf Levee District, the closure of Bayou des Glaizes near its mouth connecting the line of levee in Red River and Bayou des Glaizes Levee and Drainage District with that of the Red River, Atchafalaya and Bayou Bœuf Levee District, now extending south from Simmsport.

This would obviate the necessity for the construction by the Red River and Bayou des Glaizes Levee and Drainage District of some forty-five miles of levee up the left descending bank of Bayou des Glaizes, estimated at 1,500,000 cubic yards, and render no longer imperative, except as a secondary line of defense, for the Red River, Atchafalaya and Bayou Bœuf Levee District the long line of improved levee extending along the right descending bank of Bayou des Glaizes, built and maintained by the Red River, Atchafalaya and Bayou Bœuf Levee District.

Such a line of levee would afford a more thorough and effective system of protection against overflow from Red River and the other streams, already described, and permit the Red River and Bayou des Glaizes Levee and Drainage District to inexpensively drain directly into Bayou des Glaizes.

In this, however, the interests of the Red River, Atchafalaya and Bayou Bœuf Levee District would be vitally affected.

The drainage of the Red River, Atchafalaya and Bayou Bœuf Levee District, from Alexandria to Bayou des Glaizes, is already established, discharging into the Bayou des Glaizes through an extensive chain of drainage canals, at a point known as the "Junction," the discharge being then carried by Bayou des Glaizes into the Atchafalaya River.

The closure of Bayou des Glaizes would, therefore, necessitate the provision for disposing of this discharge in other directions.

To do this is not entirely practicable, but, aside from its probable cost, it is also inviting as far more comprehensive and far-reaching in its ultimate benefits to the two districts interested, and

can be accomplished, first, by dredging Bayou Rouge to a proper grade and section from the "Junction" to a point as far down Bayou Rouge as might be shown by survey to be necessary—probably to the State canal—near the junction of Bayou Rouge with the Atchafalaya River; secondly, by opening an outlet, by means of a properly constructed culvert or otherwise, through the dike across Yellow Bayou on Bayou des Glaizes, near Simmsport, and improving Yellow Bayou and its connections to the same point; and, thirdly, by improving the channel way from the point of junction of the first and second arteries, south and parallel to the Atchafalaya River to the Bayou Courtableau.

It is difficult with the information now at hand to place an exact estimate upon the cost of this combined project for improving drainage for the two districts, but it could not well amount to less than $350,000, to be divided between the two districts in proportions to be determined.

Aside from the question of drainage, the plan involving the closure of Bayou des Glaizes, and the extension of the lines of drainage to the Courtableau, as described, would improve conditions for the Red River, Atchafalaya and Bayou Bœuf Levee District, by removing the influence of back water from the Atchafalaya River to a plane so much lower than that at present, during periods of high water, that its effect would rarely, if ever, be felt in any part of the district. This plan, however, as before stated, could only be entertained by and with the consent of the Red River, Atchafalaya and Bayou Bœuf Levee District.

Returning to the first proposition, it is the opinion of the Board of State Engineers, that the operations of the Red River and Bayou des Glaizes Levee and Drainage District should occur in the following order:

First—The construction of the levee along Red River, commencing at a point near David's Ferry, to be designated by the Board of State Engineers, down to the head of the Atchafalaya River.

Second—The construction of the line of levee along the Atchafalaya River, from a point near its head to a point near the mouth of Bayou des Glaizes.

Third—The construction of the line of levee along the Bayou des Glaizes, from a point near its mouth to a point near the Long Bridge, and thence across to the Avoyelles Prairies, conjointly with specific plans and provision for effective drainage.

Levee work should be commenced at the upper end of the system on Red River and be carried on and completed in a continuous line, as far as the means of the district and the stages of water in the streams affecting the district will permit, to its finally adopted terminal point.

For the line of levee recommended, the Board of State Engineers would prescribe a grade 3 feet above the plane of the highest water of record in the streams paralleled, crown ranging from 6 to 10 feet in width, according to the height of levee, and side slopes of three horizontal to one vertical for each side of the embankment. Also, where the levee line crosses sloughs and bayous and such depressions as appear to require it, banquettes should be added to the land side of the embankment, the grade and dimensions of which to be determined by the engineer in charge.

The question of drainage not being necessarily involved at this time, on account of the remoteness of the time at which it is likely to be undertaken, when the amount of levee work which must first absorb the attention of the district is considered, the Board of State Engineers would ask for further time in which to make more specific recommendations for its consideration.

Taking up the question of its immediate operations which it may be advisable and possible for you to inaugurate this season, discussed at Marksville on the 1st instant, the Board of State Engineers finds that a line of levee on Red River from a point at or near David's Ferry to a point below Bayou Natchitoches, will, by throwing out certain extreme points, be about 23 miles long, and built to the grade and section before advised, will contain about 2,000,000 cubic yards of earthwork.

The construction of this line of levee is recommended by the Board of State Engineers.

In inviting proposals to construct this line of levee, the Board of State Engineers would advise that it be advertised as a whole, the prospective number of cubic yards to be included in the contract to be estimated and specified at about 2,000,000, not less than 100,000 cubic yards of which must be placed in position and completed each and every month from the date of commencement until the entire line be completed, each continuous 5,000 feet from the upper end down stream, when completed in all respects as required by specifications, to be measured up and received, and the contractor relieved from further

responsibility for its care, maintenance and protection, reserving 10 per cent. of the value of the work until final settlement for the entire line of levee; provided, that the contractor properly and effectively protect the lower end of the work, at any point at which he may be compelled by the stage of the stream against the waters of which the levee is being constructed, to suspend operations.

If it be contemplated by your Board to begin active operations this season, the earlier you now advertise the work proposed to be done the better, and the Board of State Engineers would suggest a date not later than the 3d of October.

In the meantime, if your Board desires it, the Board of State Engineers will, through Assistant State Engineer Lombard, locate and survey the line of levee from a point on Red River near David's Ferry to a point below Bayou Natchitoches, and be prepared by the latter part of this month to furnish maps, profiles, specifications and estimates of the same, for your information and that of prospective bidders.

Respectfully,

The Board of State Engineers.

Per FRANK M. KERR,

Chief State Engineer.

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., May 30, 1904.

Brig. General A. Mackenzie, Chief of Engineers U. S. A., Washington, D. C.:

DEAR SIR—The Executive Committee of the Joint Organization of the Atchafalaya Basin and Lafourche Levee Boards, which has charge of the improvement of Bayou Lafourche with a lock and dam, under Acts of the Congress of the United States and of the Legislature of the State of Louisiana, has had referred to it certain correspondence which has passed between yourself, Senator Samuel D. McEnery, and Hon. W. W. Heard, Governor of Louisiana, and has received a communication from Captain Bromwell, United States Engineer Corps. This correspondence bears upon the extension of time for the completion of the Donaldsonville Locks, which has been granted to the Levee Boards by a recent Act of Congress. Its purport is that, although the extension of time allowed by Congress does not require the Levee Boards to give a bond for the removal of the temporary dam at Donaldsonville when this new time limit expires, yet it is stated to be your

opinion and desire that, in order to safeguard the interests of the United States, a bond should be given, similar to the one existing and expiring on December 13, 1904, guaranteeing the United States Government against loss in the removal of the dam at the expiration of this new time limit. Being the member of the Board of State Engineers in charge of the work, the Executive Committee has instructed me to communicate with you on the subject, and to express its views.

The Atchafalaya Basin Levee Board and the Lafourche Levee Board, who are doing this work, are part of the executive branch of the government of the State of Louisiana, and, of course, feel that it is their first duty to enforce not only all State laws, but also such United States laws as bear upon the works which they have in charge. It is, therefore, their first endeavor, in the discharge of their duty, to act in accordance with these laws, and, realizing this fully, they would not think for a single moment of evading that law of the United States Congress which requires the removal of the dam at the expiration of a period of three years from December 13, 1904. They are willing to assure you of this in any manner that may be acceptable to you; by entering into agreement, by the passage of resolutions which would suit you, etc., but if you think that the War Department would want, beyond this, the execution of a bond on their part that they will carry out this law of the United States, they certainly will go to the limit of your wishes in this matter.

The Levee Boards have been carrying out strenuously the work imposed on them by the Act of Congress and by the State laws on the subject of the improvement of Bayou Lafourche. They have built and completed a temporary dam at Donaldsonville. This dam, although it is of unusual dimensions, has been severely tested by the 1904 high water, and on account of the existence of a substratum of quicksand under the base of this dike it has seeped and leaked very freely for the past two or three months, causing a large portion of its rear slope to slough down, and necessitating active and intelligent work in order to hold it intact.

In addition to this the Boards have some dredges in Bayou Lafourche cutting out the channel to the permanent six-foot required by law. These dredges, since the month of October last, have cut through 14.5 miles of bars, and are pushing this work with all possible vigor. In addition to this, the Levee Boards have authorized the opening of navigation canals into Bayou Lafourche, which

heretofore were separated from it by the existing levee lines. The opening of these canals, which is about completed now, will give through water communication between the city of New Orleans and points along Bayou Lafourche all the year round, a condition which never has existed in the past on account of the many bars which annually were deposited in Bayou Lafourche by the silt-bearing waters of the Mississippi River, and which for seven or eight months of the year interrupted all but flat-boat navigation throughout the bayou.

The enclosed extract taken from the report of the Board of State Engineers, made to the Governor of Louisiana, and dated April 20, 1904, treats at length of the work undertaken on Bayou Lafourche.

The Levee Boards are also authorizing the erection of a pumping plant at Donaldsonville, which will furnish 50,000,000 gallons of fresh water daily to Bayou Lafourche, in order to comply with the Acts of the State Legislature bearing on same.

You will, therefore, see that the Levee Boards are straining every point to execute this very large work which has devolved upon them as a result of the laws passed on the subject. It is a very great undertaking and a very expensive one, the cost of which is to be met entirely from their own revenues. An enterprise of this magnitude necessarily takes considerable time, but the benefits to be derived from the absolute protection of the lands on Bayou Lafourche from annually recurring overflows will amply justify, in the minds of the Levee Boards, the expenditure incurred on this project.

I write you at length on this subject, so that the War Department might be fully posted upon what is going on in this matter, and that it may fully realize the earnestness of the Levee Boards. They mean and intend to carry out the law in every respect. They feel that they have no option in the matter, but are only officials whose duty it is to strictly carry out the laws; yet, if you think that it is necessary for them to give bond that they will remove the dam at the end of three years from December 13, 1904, although the law does not require this bond, their desire is to work in thorough harmony with the officers of the United States Government and to do all things which your Department may think necessary in the premises.

Very respectfully yours,

ARSENE PERRILLIAT,
Member Board of *State Engineers.*

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., September 19, 1904.

Mr. J. S. Brady, Chairman Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards:

DEAR SIR—I beg to report that owing to the sloughing which has taken place in the dike at Donaldsonville it should be repaired and placed in condition before the next high water. I would suggest that the repairs be done as follows:

First—That the back slope which has sloughed away be restored with a 4 to 1 slope, putting in a banquette 40 feet wide at an elevation to be determined by the natural elevation of the ground at that point.

Second—That the earth which was put during the high water on the front slope of the dike be dressed and sloped uniformly.

Third—That borings be made at four points along the front slope of the dike to determine the thickness of the quicksand underlying the dike and to ascertain if there is a stratum of clay within a limited depth of this layer of quicksand. Should these borings reveal that such a layer of impervious clay exists within a depth that can be reached by the driving of sheet piling, I would suggest that a watertight sheet of tongued and grooved piling be driven through this quicksand so that their bottoms will reach well within the impervious layer of clay. In this manner the excessive seepage which caused the sloughing of the dike during the last high water could be very materially, if not entirely, checked.

Fourth—I would suggest that in connection with the installation of the pumping plant, the siphons be raised so that their lower side be at the standard grade adopted by the Mississippi River Commission and to which the levees of the Atchafalaya Basin and Lafourche Levee Districts have been built in that vicinity. At present the cut in the dike through which the siphon rests is two feet below commission grade, making that spot of the dike two feet lower than the grade of the levees in the neighborhood, both in the Atchafalaya Basin and Lafourche Levee Districts. The proper time to raise these siphons and fill the gap to the required grade is during the installation of the pumping plant, which will be during the next thirty days.

I respectfully recommend that your executive committee take steps to have this work done as soon as possible so as to insure its

being completed before the next high water season, and therefore assure the safety of the dike as far as lies within the power of your committee.

Very respectfully,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., December 21, 1904.

To the Honorable J. S. Brady, Chairman, and to the Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Districts, New Orleans, La.:

GENTLEMEN—I beg to again call your attention to the condition of the dike across Bayou Lafourche at Donaldsonville. This condition was made the subject of a special report, dated September 9, 1904, and addressed to the Honorable J. S. Brady, chairman of the executive committee. It contained four recommendations as to the work which, in the opinion of the Board of State Engineers, should be done on said dike, in order to make it safe before the coming water. Somewhat more than three months have elapsed since that date, and no work has yet been done on the dike.

The subsequent examinations and borings which have been made by the Board of State Engineers have confirmed the statements made in this report, and we urge that for the safety of the dike work be done at once on it. Owing to this late day in the levee building season, the work which will be done now will not be as well settled and packed as it would have been had it been done earlier in the season, as advised by the Board of State Engineers. But still there is imperative necessity for work being done on the dike in accordance with the lines suggested.

The location of this dike and the fact of its great height would make a disaster at that point one of a peculiarly appalling character. The giving away of this dike would in all probability carry away the levee at Donaldsonville, thereby causing a most disastrous crevasse at the head of the Lafourche District; and further down the bayou the waters would find their way through the Lake Bœuf opening and the Harang opening, on the Lafourche Basin side, and through Howell's Crevasse, on the Atchafalaya Basin side, thereby

causing certainly three crevasses, and possibly more, throughout the territory contiguous to Bayou Lafourche.

We are prepared to furnish to your Honorable Body detailed plans and specifications for the restoration of the back slope of the dike, and the building of a suitable banquette, also for the driving of sheet piling at a suitable point under the base of the dike, so as to intercept the flow of water and the movement of material in the sub-strata of sand underlying the dike. Arrangements would have to be made for the bringing of a scraper force to handle the earth required, and for the erection of a suitable pile driving and jetting apparatus to drive in the sheet piling. All of this will consume time, and, as you are well aware, the day for the high water season is nearly at hand.

It would be desirable to build this banquette or back slope with selected material. If there is any possibility whatsoever of getting or purchasing the material, it should be clay instead of sand. In doing this work the siphon plant now over the dike would in all probability have to be disturbed. We realize that this is undesirable at the present time, but we think it certainly a lesser evil to do this than to take chances on another high water season with the dike in its present condition.

We, therefore, urge you most earnestly to undertake the work of repair on this dike on the lines suggested in this report and in our previous report of September 9 with the least possible delay.

Very respectfully,

The Board of State Engineers,

Per ARSENE PERRILLIAT,

Assistant State Engineer.

STATE OF LOUISIANA,

OFFICE BOARD OF STATE ENGINEERS,

NEW ORLEANS, LA., May 2, 1905.

To the Honorable Chairman and Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.:

GENTLEMEN—On the occasion of your meeting, called for May 2, 1905, we have thought that it would be proper for us to submit to you a general report on the work done up to date on the Bayou Lafourche project, with such remarks and recommendations for

the future as we think would be useful for the further development of the project.

Dredging in Channel.

The work of dredging the bayou was begun in September, 1903, Since that time from one to four dredges have been engaged in cutting out the channel in accordance with the requirements of the law. Some 111,600 feet, or 21.2 miles of channel, have been cut, representing an excavation up to date of some 370,000 cubic yards. Of this, 14.2 miles have been cut between Donaldsonville and Napoleonville, 2.6 miles between Napoleonville and Raceland, and 4.4 miles between Raceland and Harang's Canal. The bars which obstructed navigation at the time of the closure of the bayou have been generally removed, and, although in a number of places the required six feet of water are not yet to be found, yet the crests of the bars have been cut so as to afford good flat-boat navigation wherever the dredges have worked.

The dredges used by the contractors in cutting out this channel have not been of such a character as to produce the best work, owing to the very limited reach of three out of the four dredges. This has resulted in the contractors handling a great deal more earth than they have been paid for under their contract and in the work progressing more slowly than was desirable, the Boards, however, only paying for the channel delivered.

The condition of the channel, however, between the railroad bridge at Donaldsonville and the dike is the most unsatisfactory of the entire bayou. This has been cut out twice, but, owing to the steepness of the bank, to the quicksand which underlies that locality, and to the sediment deposited by the pumps and the siphons, it has shoaled up until at present the depth varies along that stretch from about four feet at the railroad bridge to barely one foot near the wagon bridge. The dredge now engaged in cutting out this channel has a limited reach, and, as a great deal of material has already been deposited on the banks, much of the material which it excavates runs back into the bayou. Some radical change should be adopted in the method of handling this stretch and the material excavated should be carried away or deposited beyond the levee. It would also be very desirable if some change in the method of supplying the bayou with fresh water were devised, to do away with the silting up of that part of the channel, caused by the siphons.

DONALDSONVILLE DIKE.

On February 23, 1904, the dike at Donaldsonville was completed. It contained 38,614 cubic yards, was 415 feet long, and of unusually large dimensions, the crown being 30 feet wide, the river slope 3 horizontal to 1 vertical, and the land slope 4 horizontal to 1 vertical.

During the high water of 1904 the land slope of the dike began to slough off. This slough was very unusual in its character, and was not caused by seepage through the dike or a saturation of the slope of the dike, but seemed to be induced by a movement of the material underlying the base of the dike. This slough assumed alarming proportions, and it was deemed necessary, as a measure of safety, to bring a force of teams on the ground, and during the high water of 1904 to add more earth to the dike. After the subsidence of the water, the Board of State Engineers, after having thoroughly investigated this trouble, submitted a report on the subject to your Honorable Chairman, dated September 9, 1904, and embodying recommendations for the treatment of the dike. Subsequent investigations on the part of the Board of State Engineers further strengthened them in the views which they had formed on the subject, and on December 21, 1904, they made an additional report on the subject, urging that work on the dike be begun without further delay. Your Honorable Board then ordered this work to be started, which consisted of driving a row of sheet piling across the base of the dike and of restoring the material which had sloughed away during the high water of 1904.

The same symptoms which had appeared during the 1904 high water developed during the 1905 high water, and the force of teams which was steadily employed on the dike during the last three months has had to contend with many disadvantages to carry on its work. The work on the dike is not yet completed so as to make it as large and as strong as it should be, in view of the sandy substrata which underlie its base, and we would recommend that a banquette and a flat slope be built along the land side of this dike in order to counteract the flow of the underlying sand which takes place during the high water stages of the river. It might be possible to combine the building of this banquette with the dredging of the stretch between the dike and the railroad bridge. A plan to transport the earth excavated by the dredge by means of small dump cars and deposit it on the land side of the dike could be devised, which would accomplish a double purpose, without great expense.

Fresh Water Supply.

In accordance with the law, your Honorable Body took steps early to provide the bayou with a supply of fresh water. A canal three miles long and containing about 136,000 cubic yards was dug by you connecting Lake Bœuf with Bayou Lafourche. Since that time a canal connecting Lake Fields with Bayou Lafourche has been opened, and a canal connecting the Acadia swamp with Bayou Lafourche is being cut. The Company Canal and the Harang's Canal have been opened into Bayou Lafourche. The above four canals have been cut without expense to your Boards. The Lake Fields Canal is giving and will give during times of rainfall a large supply of fresh water to Bayou Lafourche. The Acadia Canal will furnish a moderate supply under similar conditions. The Company and Harang's Canals may be considered of uncertain value, as at times, during periods of drouth, they may be a source of salt water to the bayou, although during periods of rainfall they will also give a fair supply of fresh water to the bayou. Your Boards, however, have wisely surrounded the permission given to open the Company Canal and the Harang's Canal into the bayou by provisions which will exclude salt water from Bayou Lafourche should they become a menace in that direction.

All of these canals will give a large supply of fresh water to Bayou Lafourche during periods of rainfall, but during periods of drouth they cannot be depended upon for a supply of fresh water, as the basins with which they connect fall, at those times, as low as the level of the Gulf.

In order to supplement these canals your Board established a plant of five 18-inch siphons across the dike at Donaldsonville. These siphons run naturally when the river is high and are assisted by a floating pumping plant, situated at Donaldsonville, during the period of low water. These siphons have a capacity well over 50,000,000 gallons per 24 hours during high water, and the pumping plant was designed so as to give them a 50,000,000 gallons capacity at low water season. Upon test, the pumping plant fell somewhat short of this capacity, delivering 47,439,000 gallons of water over the dike instead of the required 50,000,000 gallons.

On general principles, although water coming from the Mississippi River is very good and fresh in character, yet it carries with it a considerable amount of sediment, which will be deposited a short distance from the dike, thereby filling up to a certain extent the

bed of the bayou and undoing your efforts to dredge out a six-foot channel. It is estimated that 50,000,000 gallons of water at high water season will carry 200 cubic yards of sediment, which will be deposited in the bayou and which will have to be removed by dredge.

During the winter season of 1904-5 an unprecedented condition of drouth prevailed throughout the Bayou Lafourche region. The result was that the Lake Bœuf Canal did not supply any quantity of fresh water worth mentioning. Your Honorable Body decided to build a needle dam just above the Harang's Canal so as to prevent the inflow of salt water into the bayou. The work, however, was begun so late that it was not completed until the grinding season had begun, and a large quantity of salt water found its way up the bayou from the sea before the dam was completed. The erection of the pumping plant was also begun late, the pumps did not begin operating until some time after grinding had commenced, and for two or three months after they began operating the reports show that they never operated more than four siphons, and sometimes only two siphons. Under the circumstances, a considerable amount of salt water was to be found in Bayou Lafourche, extending at times as far up as the Bush Grove Sugar Refinery.

It would be desirable to make provisions early in the season against a repetition of such conditions. The pumping plant should be put in thoroughly efficient condition early in the season, and should be run by competent men, so that it might operate at its maximum capacity throughout the grinding season. The needle dam should be repaired and put in condition early in the season so as to be efficient if it is needed. The interest controlling the Company Canal and the Harang's Canal should be called upon to provide such gates or needle dams as might be necessary to close their respective canals at once, should they become a source of salt water during the grinding season, and in addition to this an additional source of fresh water should be secured by opening a canal connecting Lake Verret with Bayou Lafourche.

Lake Verret Canal.

The Board of State Engineers has made some investigations of Lake Verret as a possible source of fresh water to Bayou Lafourche. Lake Verret is a body of water some ten miles long and about three miles wide, on the west of Bayou Lafourche, running parallel to

it at an average distance of six or seven miles, and extending from a point opposite Enola down to a point opposite Pugh-Himel Plantation. It connects with the Atchafalaya River by several bayous at its upper ends, and it also receives at its upper end, through Grand Bayou, the drainage of the territory between Bayou Goula and Donaldsonville on the Mississippi River. At its lower end Lake Verret communicates with the Atchafalaya River near Morgan City by two or three bayous and lakes.

During the period of high water it receives a large supply of fresh water from the Atchafalaya River. During periods of low water its surface falls down to the level of the Gulf. Surveys made by this office revealed the fact that du ng the high water of 1903 level of Lake Verret was 2.7 feet ove the level of the Gulf, ch is also the level of the water i Bayou Lafourche. Further investigations and inquiries n ld residents living on the banks of Lake Verret gave tion that Lake Verret was ways a body of fresh w an old resident stated that one or two occasions the wate ecome brackish where Lake rret connects at its e Atchafalaya River. We eve that it would be t a canal connecting Lake ret with Bayou Lafourche. nal should be cut at a point as remote as possible from that part of the lake which is said to have been brackish at times.

When the surface of Lake Verret is high, owing to its connection with the Atchafalaya River, then it would supply, by a natural flow, a large quantity of fresh water to Bayou Lafourche. During low water season, however—which by the way is generally during the grinding season—when the lake comes down to mean Gulf level, then the floating pumping plant, now situated at Donaldsonville, could be used on the bank of such canal, and made to supply the bayou with a large quantity of fresh water. Under these conditions, the pumping plant would be established on a solid foundation, would have to lift the water barely two or three feet over a suitably built dam, instead of working as it does at present under the disadvantage of being on a floating foundation, and having to force the water through some 800 feet of pipe and over a dike 34 feet high.

We have submitted the above lengthy report to you for your consideration and we especially urge that whatever steps you decide to take be determined upon at as early a date as possible. All of *the works* outlined herein are large works, involving considerable

expenditure and consuming much time for their execution, and should you determine on a line of action even at the present day there would be but barely time to complete any extensive project before the grinding season.

Very respectfully submitted,
The Board of State Engineers,
Per ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 2, 1905.

To the Honorable Chairman and Members of the Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.:

GENTLEMEN—In accordance with your desire expressed some time ago, and with your resolution passed at a meeting of your committee held on May 2, 1905, the Board of State Engineers has caused three surveys to be made for the project of a canal to connect Lake Verret with Bayou Lafourche. We now beg to submit to you a report of deductions, based on said surveys.

As the intention of such a canal is to furnish an adequate supply of fresh water to Bayou Lafourche, in accordance with Act 84 of 1902, we think it is proper at this time to report somewhat at length on the subject of a supply of fresh water for Bayou Lafourche and on the best means of procuring same.

When the dam was completed at Donaldsonville, Bayou Lafourche was entirely cut off from the Mississippi River and became a bay or an arm of the Gulf of Mexico. The level of the water in Bayou Lafourche as far up as Donaldsonville became of the same level as that of the Gulf, and subject to the same tidal fluctuations as the Gulf itself. As a result, a slight tidal oscillation can be noticed in the level of the bayou water at Donaldsonville, and when the wind of the Gulf either raises or lowers the Gulf level the influence is felt as far up as Donaldsonville. Since the closure of the bayou a wind tide as high as two feet above mean Gulf level has been noticed on the gauge in the bayou at Donaldsonville.

If nothing were done to supply fresh water to Bayou Lafourche it would, under natural conditions, be kept moderately fresh by the rainfall in the bed of the bayou itself which would find its

way gradually to the Gulf, thereby excluding the ascent of salt water. If, however, water is abstracted from Bayou Lafourche, either for rice irrigation or sugar house supply, then the salt water from the Gulf ascends the bayou in proportion to the quantity of water artificially abstracted.

In order to offset this, the joint organization of the Atchafalaya Basin and Lafourche Levee Boards has cut a canal connecting Lake Bœuf with Bayou Lafourche on the east bank, and on the same bank has authorized the opening, without expense to the Boards, of the Company Canal, the Harang's Canal, the Mathews Canal and the Foret Canal. On the west bank it has similarly authorized, for the purpose of supplying fresh water to the bayou, the opening of the Blanchard Canal, the Acadia Canal, and the Lake Fields Canal. Of these, the Lake Bœuf Canal, the Company Canal and the Harang's Canal on the east bank are already opened into Bayou Lafourche, and on the west bank the Acadia Canal and the Lake Fields Canal are at present opened into the bayou. In times of rainfall these canals do and will supply a large quantity of fresh water to Bayou Lafourche. Whether they would supply a sufficient quantity at the time when water is abstracted from the bayou for irrigation or sugar house purposes would depend entirely upon the ratio between the rainfall and the quantity of water taken out of the bayou. We believe that during rainy seasons the inflow into the bayou would be more than sufficient to offset the quantity of water taken out of the bayou, but during periods of drouth, especially during such a drouth as was prevalent during the winter of 1904-5, the inflow into the bayou from rainfall was practically nil, and salt water ascended the bayou in order to replace that which was abstracted for agricultural purposes. In such periods of drouth, also, the Company Canal and the Harang's Canal would supply salt water from Lake Salvador, and for that reason your committee has surrounded the permit which it has given to open these canals into the bayou by a provision compelling the owners of these canals to close the same with gates at such times as they would supply salt instead of fresh water.

In order to further safeguard the fresh water in the bayou the Levee Boards have constructed a needle dam across Bayou Lafourche immediately above Harang's Canal. This needle dam is nothing but a dike placed across the bayou, constructed of timber and earth,

with an opening left in it 30 feet wide by 6 feet deep. This opening can be closed when desired by 2x4 inch sticks or "needles" as they are called, so that, when it is desired, the opening can be closed to prevent the ingress of salt water into the bayou, and when it is required to allow the passage of navigable craft it can be opened by removing these piles or needles one by one. A needle dam is nothing but a cheap form of lock.

In order to further assure a supply of fresh water to Bayou Lafourche, the joint organization of the two Boards has placed a siphon plant across the dike at Donaldsonville, which has been supplemented with a pumping plant, connecting with the siphons, of 50,000,000 gallons capacity per twenty-four hours.

In our report of May 2 to your committee we have called your attention to the fact that the siphons and pumping plant put water into the bayou coming from the Mississippi River and laden with silt, and we have estimated that at times of high water, when the Mississippi River is heavily charged with sediment, the amount of silt carried over by 50,000,000 gallons per twenty-four hours would represent about 200 cubic yards, which silt would destroy the channel which you are dredging in the neighborhood of Donaldsonville, and which, therefore, would have to be removed by dredges. This is borne out by the fact that you have already three times dredged out the channel within 2,000 feet of the dike and it has been filled and silted up largely by the silt brought over the dike by the siphons. All of these matters have already been broached in my report of May 2 to your committee.

On the west bank of Bayou Lafourche and parallel to it at a distance varying from 6 to 8 miles is situated Lake Verret. This lake is about 10 miles long and about 3 miles wide, and its upper end is situated at a point west of the Enola Plantation. Lake Verret is practically a branch of the Atchafalaya River, and therefore receives a flushing of fresh water every year from that stream. It has a large reservoir capacity. During the high water period of 1882 its level rose to an elevation of 12.5 feet above mean Gulf level. During the high water period of 1897 it rose to an elevation of 8.3 feet above mean Gulf level, and during the high water of 1903 it rose to an elevation of 2.8 feet above mean Gulf level. During the low water season, however, when it receives practically no supply from the Atchafalaya River, its level falls to the same level as the Gulf and, therefore, to the same level as that of the water in the bayou. As the low water season is coincident with the grinding season, Lake

Verret, therefore, would not be a natural supply of fresh water to Bayou Lafourche at these times. The water from Lake Verret would have to be pumped into the bayou at such times.

Again, we have made an effort to ascertain whether Lake Verret had ever been known to be brackish or salty. A number of prominent gentlemen living in the neighborhood have positively stated that Lake Verret had never been known to be brackish or salty. One gentleman, however, whom we interviewed, a resident on the banks of the lake, stated that on one or two occasions he had known Lake Verret to be brackish in its southwestern corner at the point where it connects with the Atchafalaya River near Morgan City. The preponderance of evidence, however, has been that Lake Verret had never been known to be brackish or salty.

In accordance with the request of your Honorable Committee we have made surveys connecting Lake Verret with Bayou Lafourche along three lines. These lines are shown on the accompanying skeleton map, and are detailed on the accompanying three blue prints. No. 1, or the Grand Bayou route, connects Bayou Lafourche at a point near Paintcourtville with the Grand Bayou at a point about 2 1-4 miles above its junction with Lake Verret. No. 2, or the Elm Hall route, connects Bayou Lafourche at a point near Napoleonville with Lake Verret at the mouth of Bayou Cocodrie. No. 3, or the Drainage District route, connects Bayou Lafourche at a point about 4 miles below Napoleonville to a point near the southern extremity of Lake Verret.

As stated above, owing to the fact that during the grinding season Lake Verret is down to near mean Gulf level, it would be necessary to establish a pumping plant along the bank of this canal so as to give the water an artificial elevation and force it to flow to the bayou. This pumping plant should have a capacity of not less than 50,000,000 gallons per twenty-four hours, and possibly as great as 80,000,000 gallons. Your present pumping plant properly installed would serve such a purpose. During times of rainfall and rainy seasons Lake Verret would be a reservoir of ample capacity to remain fresh against such an abstraction of water from its area. In times of drouth, however, the water thus taken by a pumping plant would have to be replaced from somewhere, and it might be possible under such conditions for the water which would come through Bayou Long, Flat Lake and the Atchafalaya River, near Morgan City, if the season were very dry, to render the lake, or at any rate

some part of it, brackish or salty. Under these conditions, should they ever occur, that part of the lake would become brackish first nearest to its southern connection with the Atchafalaya River, and under such conditions the salt water would reach the pumping plant first in canal No. 3, second or later in canal No. 2, and third or latest, if at all, in canal No. 1.

We are not prepared to state that salt water will ever come into Lake Verret, nor are we prepared, on the other hand, to make the statement that with a 50,000,000 gallon pumping plant abstracting water from said lake it will, at all times, remain free from salt water. Experience only will demonstrate what the new conditions will produce. But we are prepared to state that the order in which the salt water would make its appearance into the various canal routes would be in the order above mentioned.

In making a project for these canals, we have ascertained that a canal with a bottom width of 35 feet and slopes with an inclination of one horizontal to one vertical would be necessary to carry the required supply of water. This would make the top width equal to twice the depth plus 35. Again in establishing these dimensions it has been determined to place the pumping plant not at one end or the other of the canal, but as near the middle as conditions will permit. Should the pumping plant be placed at either one or the other end of the canal, the canal dimensions would have to be larger. Therefore, the project contemplates as small a canal as will supply the 80,000,000 gallons per twenty-four hours during the pumping time and still flow under its natural head at such times as Lake Verret is high.

The following gives an outline of the three lines surveyed:

Grand Bayou Route, or Line No. 1.

This line was located generally on information furnished and location requested by Mr. H. Dugas and G. Labarre. Length of line 33,700 feet, or 6.4 miles, of which 14,500 feet, or 2.8 miles, is in field, and 19,200 feet, or 3.6 miles, in woods. No canal or ditch at present on said line. Pumping plant situation about 2.5 miles from Bayou Lafourche. Water surface in Grand Bayou May 5, 1905, 1 foot above mean Gulf level. Water surface in Bayou Lafourche May 5, 1905, 1 foot above mean Gulf level. High water 1903, in Grand Bayou, 2.8 feet above mean Gulf level. Excavation required to cut out canal in accordance with above dimensions, approximately 561,000 cubic yards.

ELM HALL ROUTE, OR LINE NO. 2.

The location of this line was selected so as to make use, as much as possible, of canals excavated by the Godchaux Planting Company and by various timber companies who have cut canals into the swamp to reach their timber, with the view of diminishing as much as possible the excavation required. Length of line 37,500 feet, or 7.1 miles, of which 16,500 feet, or 3.1 miles, is in field, and 21,000 feet, or 4 miles, in woods. Along this line 22,800 feet, or 4.3 miles, out of the total, has some excavation done on it, most of which, however, [illegible] not of sufficient depth or se[illegible] umping plant situation at 15,000 feet, or 2.9 miles from [illegible] fourche. Water surface in [illegible]ake Verret April [illegible] an Gulf level. Water sur[illegible]ce in Bayou Laf[illegible] .3 above mean Gulf level. [illegible]gh water of 1[illegible] e mouth of canal, 2.7 feet [illegible]ve mean Gul[illegible] uired to complete canal to [illegible]mensions, approxim[illegible] yards.

D[illegible] OR LINE NO. 3.

This line wa[illegible] out by Messrs. Cancienne, [illegible]ot, Barton, Wor[illegible] d follows the line of canal partly excavated by a drainage district organized to drain that section of country into Lake Verret. Length of line 40,200 feet, or 7.6 miles, of which 14,500 feet, or 2.7 miles, is in field, and 25,700 feet, or 4.9 miles, in woods. Along this line 31,000 feet, or 5.9 miles, of canal has already been cut, although it is not of sufficient section and depth. Pumping plant situation at 24,000 feet, or 4.6 miles, from Bayou Lafourche. Water surface in Lake Verret on May 25, 1905, 1.1 feet above mean Gulf level. Water surface in Bayou Lafourche on May 19, 1905, .3 feet above mean Gulf level. Height of water of 1903 in Lake Verret opposite this canal, 2.5 feet above mean Gulf level. Excavation required to complete canal to dimensions, approximately 509,000 cubic yards.

The above embodies all of the points which we have investigated, and which we think will be of service to your Honorable Body in determining your line of action in the premises.

We beg to submit further that the estimates of contents are not final figures, but approximate estimates of yardage required, and subject to changes on closer and more detailed surveys. We also beg that you will bear in mind that, should your committee decide to

change the depth of the canal or the location of the pumping plant along said canal, the excavation required would be changed thereby.

Respectfully submitted by

The Board of State Engineers,
Per ARSENE PERRILLIAT,
Assistant State Engineer.

ADDENDA.

We beg to further submit that, should your Honorable Committee countenance the building of a high level canal for that part of the canal which will lie between the pumping plant and Bayou Lafourche, the quantity of excavation could be largely reduced, although the cost of fuel consumption would be increased. Such a canal, for instance, could be excavated so that its bottom would be, say, at the same level as that of the Gulf, and the water from Lake Verret would have to be lifted up by the pumps so as to raise it to an elevation of 4 or 5 feet above the level of the Gulf. Such a canal would give very little water, if any, at such times as the pumps were not in operation, as the level of its bottom would be too high for it to allow a free flow from Lake Verret, but at times when the pumps would be in operation, by causing these pumps to lift the water 6 or 7 feet instead of 2 or 3 feet, a nearly equal supply would be provided, although at an increased consumption of fuel.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 15, 1905.

To the Presidents and Members of the Joint Organizations of the Atchafalaya Basin and Lafourche Levee Boards, Donaldsonville, La.:

GENTLEMEN—Since your last regular meeting held at Donaldsonville in July, 1904, a large quantity of work has been done in connection with the Lafourche project, and new developments have taken place in the work which was being carried on under this project.

The work accomplished and the character of these developments have been reported from time to time to your Executive Committee by the Board of State Engineers, and recommendations have been made to said Executive Committee by the Board of State Engineers.

Copies of the most important of these reports are attached hereto.

The condition of the dike at Donaldsonville and recommendations as to the treatment thereof are embodied in the report of the Board of State Engineers of September 9, 1904. A great deal of this work has been carried out, but the banquette and slope on the land side of the dike have not yet been completed. We would recommend that this work be undertaken as soon as possible and completed, by contract, during the present summer months. We believe that this could be done in connection with the removal of the dredged material within 1,900 feet of the dike, in such a way as to subserve both the end of enlarging the dike and also that of providing a pit for the additional dredging of the bayou which has been rendered necessary by the movement of the sand about the dike and by the silting up due to the siphons. This point is covered in the accompanying report dated May 2, 1905, under the head of Donaldsonville Dike.

The accompanying report, dated February 9, 1905, gives the status of the pumping plant.

The accompanying report, dated May 2, 1905, reports upon the character of the dredge work done in Bayou Lafourche, showing that a large amount of the work contemplated has already been accomplished. It also treats upon the question of a fresh water supply for the bayou, making recommendations therefor. This question is treated at greater length in the accompanying report dated June 2, 1905, which is devoted exclusively to the question of a fresh water supply for the bayou, and especially to the connecting of the bayou with Lake Verret.

I believe that all of the points in connection with the improvement of the bayou have been thoroughly covered in the accompanying reports made from time to time to your Executive Committee. The problem involved is one of considerable magnitude, and it will necessarily take time to complete it in all of its details, but we believe that if carried on without interruption on the lines suggested from time to time in the accompanying reports it will be finally completed to the satisfaction of all parties concerned.

Very respectfully,

The Board of State Engineers,
Per ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 28, 1905.

Mr. J. S. Brady, Chairman Executive Committee, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, New Orleans, La.:

DEAR SIR—In accordance with the resolution passed at the last meeting of the Executive Committee, held in Donaldsonville on July 17, 1905, directing you, in connection with the Board of State Engineers, to make rules and regulations governing the opening of canals into Bayou Lafourche, in connection with the applications made and filed at that meeting, I beg to submit the following:

The Executive Committee has, in connection with the Harang, Barrow and Price Canals, adopted rules and regulations governing the opening of such canals into Bayou Lafourche. The Executive Committee recognizes that it has no right to open any canals into Bayou Lafourche for the purpose of draining lands and plantations, but it recognizes that the joint organization of the two Boards has the right to allow private parties to open canals into Bayou Lafourche, provided these canals are a positive source of fresh water to the bayou.

The rules governing the cutting of such canals by private parties in the past have been generally:

1st. That these canals be cut at the private parties' expense.

2nd. That these canals be dug in accordance with plans and specifications approved by the Board of State Engineers.

3rd. That water lilies, salt water, acids and undesirable water be excluded from Bayou Lafourche.

4th. That bridges over said canals necessary for traffic be built and maintained over said canals at the private parties' expense.

Then a penalty clause is insisted upon by the Boards to the effect that should salt water, or acids, or water lilies, or any undesirable water, find its way into Bayou Lafourche through said canals, or should the Executive Committee deem it, for any reason, desirable for the best interests of the Boards, then it shall have the right to call on the one, to whom the privilege has been granted to cut the canal, to close such canal with locks or gates, and that the failure of the grantee of the privilege to close the canal within ten days after notice shall authorize the Executive Committee to close

such canal at the grantee's expense, such canal to remain closed until gates or locks acceptable to the Executive Committee have been placed into this canal.

In other words, the Executive Committee has taken every precaution to safeguard the water in Bayou Lafourche from contamination, and the granting of the privilege to open canals into the bayou has been made subject to the above conditions.

I believe it would be well to elaborate these conditions, and that before granting the privilege to the parties who applied at the last meeting of the Executive Committee they should be requested to sign and accept the following statement and agreement:

FORM OF AGREEMENT TO BE SIGNED BY APPLICANT.

1st. We hereby affirm that the canal which we propose to cut connects a natural drainage basin with Bayou Lafourche. (Describe here the drainage basin) .....

2nd. We propose to cut this canal entirely at our own expense without any cost whatsoever to the Levee Boards.

3rd. We agree to cut this canal at its beginning in the drainage basin to a depth one (1) foot lower than the deepest depression in said drainage basin, and thence to give its bottom a slope of one-half (½) foot to the mile until a depth of three (3) feet below mean Gulf level is reached, which depth shall be maintained until the intersection of the canal with Bayou Lafourche. It is understood, however, that at no point will the Executive Committee require that the canal be cut deeper than three (3) feet below mean Gulf level.

4th. We agree to build at our own expense over said canal such bridges as may be necessary to keep open the public roads; these bridges to be built to the satisfaction of the road authorities. We further agree to build over said canal at its intersection with Bayou Lafourche a towpath or towbridge not less than six (6) feet wide, with railings on either side, and to be located along the lines generally followed by the towing teams.

5th. We agree to exclude from said canal all salt water, water lilies, sugar house acids and generally all water which may be pronounced undesirable by the Executive Committee of the joint organization of the two Levee Boards. It is especially agreed that we will exclude from such canal drainage water which is heavily laden with sediment carried from the soil, and that no drainage

ditches shall connect directly with said canal. It is understood, however, that drainage water which finds its way into this canal after having lost the sedimentary soil which it carried will not be excluded from said canal.

6th. We agree to begin cutting this canal within ..... days from date, and to carry the work on steadily and in a workmanlike manner. The plans and specifications for this canal will be submitted to the Board of State Engineers for their approval. We agree to begin cutting this canal at the end nearest to the drainage basin, gradually working toward the bayou, and opening the canal into the bayou for the last cut. This method of carrying on the work is to govern the excavation unless we are especially authorized by the State Engineer in charge to do otherwise, after our plans and specifications have been submitted to the Board of State Engineers, and after we have submitted good and sufficient reasons for departing from this method.

7th. It is furthermore understood and agreed that should at any time we fail to carry out the above obligations, and should the Levee Boards decide that it is for the best interests of Bayou Lafourche that this canal be closed, that they shall have the right to call upon us to do so, and in case of our failure to close the canal with gates or locks or otherwise within ten days after notice, then the Levee Boards will be authorized to close said canal at our expense, the canal not to be reopened until it has been provided with gates or locks acceptable to the Executive Committee of the joint organization of the Levee Boards.

.....

Applicant.

I believe that, if the applicants will sign the above agreement and statements of facts, then the opening of canals into Bayou Lafourche will be desirable and free from any harm to the project carried on by the joint organization of the two Levee Boards.

Very respectfully,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 27, 1906.

To the Honorable Presidents and Members, Joint Organization, Atchafalaya Basin and Lafourche Levee Boards, Donaldsonville, La.:

GENTLEMEN—I desire to submit to you the following report regarding the operations and conditions on Bayou Lafourche since your last meeting in July, 1905:

The bar which obstructed navigation from the railroad bridge to a point about 200 feet above the wagon bridge has been dredged out. In order to do this it has been necessary to remove with scrapers a considerable amount of earth on the upper side of Bayou Lafourche, between the two above mentioned points, in order to provide pit room for the material excavated by the dredge. This was rendered necessary by the fact that the bayou depression between those two points is very narrow, and had already been filled up by the material dredged in that stretch two or three times since the building of the dam. This operation was rather costly, but resulted in the giving of a good channel for that stretch.

The dredging has been continued down Bayou Lafourche, and the various bars between Napoleonville and Thibodaux have been cut down, so as to afford the required six feet of water over their crest. A dredge is now working in the neighborhood of Thibodaux, and will continue to work to a point about two miles below Thibodaux, when all of the bars having less than six feet of water over their crest will have been cut out to a six-foot depth.

In connection with this, as the work of dredging required now is not continuous, but is only to be done occasionally, where a bar is found or is formed, I think it could be done very much more properly and economically by the Levee Boards themselves, with their own dredge, than under the contract now existing to dredge Bayou Lafourche. This contract contemplated the deepening of the bayou where much cutting had to be done, but as the bulk of the cutting has been done, and now only occasional cutting is required, the method pursued is not as economical to the Boards as it would be if you did it yourselves under proper management.

Again, owing to the fact that a number of openings have been made into Bayou Lafourche for the purpose of supplying fresh water to said bayou, and that these openings, to a certain extent,

carry with them sediment washed away from the soil after heavy rainfalls, it is more than likely that bars will be formed opposite the mouths of such openings. For that purpose it will be necessary for you to have a dredge to maintain the required six feet of water at such points.

During the low water season of 1905-6, owing to the fact that there were a number of openings into Bayou Lafourche for the supply of fresh water, and also owing to the heavy rainfall of that season, Bayou Lafourche was kept practically free of salt water without the necessity of having recourse to the siphons or to the pumps. Whether these conditions will continue to prevail, and whether in the future there will be no recurrence of the conditions prevailing during the season of 1904-5, when there was much salt water in the bayou, can only be demonstrated by experience. But, to my mind, the fact that some ten or twelve fresh water openings now exist in Bayou Lafourche, I am inclined to think that the future will never see such a quantity of salt water in Bayou Lafourche as was the experience of the season 1904-5.

In this connection I desire to impress on your Honorable Body that it is highly undesirable to draw any more fresh water from the Mississippi River at Donaldsonville by the siphons and pumps. This plant of siphons and pumps was established as a temporary make-shift, to supply fresh water to the bayou pending such time as fresh water openings had been cut from the interior country into the bayou.

Experience has shown that the siphons and pumps bring a large quantity of sediment into the bayou, which is deposited within the first mile from the dike. This was already reported to you in a former report of the Board of State Engineers on the subject. The silting up of the bayou, due to this cause, has made it necessary, as mentioned above, to dredge four times the stretch from the railroad bridge to the dam. The banks of the bayou have been filled up by the material thus brought in by the siphons, and repeatedly dredged, and any further dredging necessary in that stretch can only be done at great cost, either by hauling the material away in cars, or else by excavating a pit with scrapers, as was done last summer. Under the circumstances, it would be highly undesirable to allow any additional water to come in from the Mississippi River and silt up this stretch of bayou.

The dam at Donaldsonville was considerably strengthened by the building of a banquette and a long land slope on it, which work

was done in connection with the excavation of the pit above referred to. In my opinion, this banquette is not yet broad or high enough to make this dam as safe as it should be and as the value of the property depending upon it demands; yet the present high water will show whether the sloughing which occurred in the two previous high waters has stopped, or whether the quicksand underlying the dam will still occasion the land slope to slough in.

It is reported from reliable authority that a number of water lilies have made their appearance in Bayou Lafourche. This is clearly due to the fact that the fresh water canals now opening into Bayou Lafourche are not protected by booms to exclude the inflow of the lilies. The resolutions passed by your Executive Committee, granting permission to open fresh water canals into the bayou, make provision for protection against the inflow of water lilies, but evidently these conditions have not been complied with. It is useless to dwell upon the importance of this menace, as the efficiency of Bayou Lafourche as a navigable stream would be entirely destroyed were it to be invaded by water lilies.

Under the circumstances, I would recommend that your Honorable Body take steps to see that the provisions of the Executive Committee are complied with by those who have opened canals into Bayou Lafourche, and further that you take steps to devise some means of destroying the water lilies now in the bayou before they grow to alarming proportions.

Very respectfully,

ARSENE PERRILLIAT,
Assistant State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 19, 1906.

Honorable R. Furman, President Police Jury, Caddo Parish, Shreveport, La.:

DEAR SIR—Recurring to the subject of your letter of the 12th inst., stating that a petition from Ward No. 1 of your parish, looking to the formation of a drainage district, had been under discussion at a meeting of the Police Jury on the 12th inst., during which you related the substance of a conversation recently had with me on the subject of a drainage system for that part of Caddo Parish lying north of Shreveport, that it was the unanimous sentiment

of the Police Jury that a "partial drainage" would be a mistake, and requesting a further expression of opinion on the subject from me, I beg leave to say:

The substance of the conversation with me referred to by you was that, in my opinion, the formation of small drainage districts anywhere, and particularly in Caddo, north of Shreveport, would prove not only unsatisfactory locally, but, eventually, sources of serious conflict and complication.

Furthermore, that the revenue possible from drainage districts covering a limited extent of territory is usually totally inadequate to the accomplishment of comprehensive and effective results, and that, therefore, questions of drainage demanded much more serious thought and consideration than they usually received, if the principle, as it should, of the greatest good to the greatest number, is to maintain.

With these views in mind, I would, therefore, say that whenever the drainage of any section of the Parish of Caddo, whether north or south of Shreveport, is agitated, a combination of interests, in that direction, should be considered, and the location and superficial area of the drainage district be governed by physical conditions and possible revenue.

Such a consummation is, in my opinion, practicable, from a combination of interests in that part of Caddo, north of Shreveport, under consideration.

A drainage district composed of all the alluvial lands in Caddo Parish subject to overflow, lying between Red River on the east, and the highlands, or hills, on the west, from the State line between Louisiana and Arkansas, on the north, to the Township line dividing Township 18 N. from Township 19 N., on the south, appears to me to present an area of sufficient extent and moneyed values to warrant the organization of a comprehensive drainage district, promising, at most times, effective and beneficial results to the greater part of it.

In the absence of considerable detail surveying and leveling it is difficult to reduce to a definite proposition the location, slope, dimensions and cost of the channels required for the operation of such a drainage district, but, in a general way, there is little doubt but that the construction of the two main arteries or drainage channels, following about the following routes, offer themselves for favorable consideration:

ROUTE NO. 1.

Louisiana Bayou, Cypress Lake, Kelly Bayou, Black Lake, Red Bayou, Sewell's Canal, Black Bayou, Clear Lake, Shift Tail Lake, Big Willow Pass, Little Willow Pass, Soda Lake and Twelve Mile Bayou, at or near where it crosses the Township line between Townships 18 and 19 north.

ROUTE NO. 2.

Ferry Lake to a junction with Route No. 1 at Big Willow Pass.

Detailed surveys and levels might demonstrate the advisability of several local departures from the routes herein outlined, and possibly some cut-offs, materially shortening the total length of the channel required, but as a general proposition I think the routes described would appeal to anyone familiar with the territory. Latteral channels, too, in certain localities, leading from the river and the foothills, to the main arteries, might also have to be considered, but, after providing the public main arteries, as a general thing these laterals might be left to the discretion and expense of those immediately interested in the particular locality where their need may be shown to exist.

In the consideration of this subject, however, I would not have the following fact lost sight of, that, under present conditions, during periods of high water in Red River, at stages say exceeding 25 feet on the gauge at Shreveport, drainage, in the lower portion of the drainage district described, would be seriously interfered with, if not entirely nullified, for the time being.

However, much benefit would accrue to it at all other times, while incalculable benefit to the upper portion of the district, at almost all times, might be depended upon.

I presume, of course, that you are familiar with the mode of procedure in forming drainage districts, but, in case you should not, it may be well for me to touch upon it in a general way also.

The various acts of the General Assembly of the State relating to drainage districts are as follows, viz.: Act 12 of 1900, relative to organization; Act 114 of 1900, prescribing manner in which municipalities, parishes and drainage districts may incur debt and issue bonds; Act 159 of 1902, amending and re-enacting Act 12 of 1900; Act 211 of 1902, authorizing drainage districts, organized under State laws, to levy annual contributions; and Act 61 of 1904, investing the various levee and drainage districts of the State with control over all drainage channels within their limits.

Under these various acts the several points of importance are, in general terms, that the Police Jury of a parish has power to divide the parish into drainage districts, or fix the limits of any drainage district, represented, by petition, to be desired by parties in interest; provided, that no such district shall contain, within its limits, less than five land owners; that a board of commissioners shall be appointed to conduct the affairs of the district, three of whom shall be named by the Jolice Jury and two by the Governor; that after the appointment of commissioners, the organization of the Board, and an election properly held for the purpose, with due notice thereof, etc., indebtedness, negotiable in bonds, to the amount of one-tenth of the assessed valuation of the property in the drainage district, may be incurred to carry out the purposes of the project.

The area of the drainage district herein under consideration, and the assessed value of the property contained in it, can be readily obtained by you from the assessor of your parish.

What, I suppose, may interest you as much as anything else in the preliminary stages of such a project, if decided upon, will be the engineering work. For this the district will be compelled to engage, at its own expense, the services of a competent and reliable civil engineer, and provide him with all the necessary assistance required for so important a line of investigation.

It is generally believed that the Board of State Engineers is charged by law with such duties, but such is not the case, the name of the Board of State Engineers appearing in only one of the Acts of the General Assembly relating to drainage districts, namely, Act 61 of 1904 ,and then only as a board of approval in the matter of channels selected by the drainage commissioners.

I mention this because due to this and the fact that the duties of the Board of State Engineers are already so numerous, and the appropriations provided to defray the expenses incurred in performing them so limited, that it would not be fair to leave you under any misapprehension in the premises in considering the responsibilities of the undertaking.

However, the members of the Board of State Engineers generally, and myself particularly, will, of course, be glad at all times to render you any service in our power in an advisory capacity.

Yours very truly,

FRANK M. KERR.

Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., August 29, 1904.

To his Excellency, Newton C. Blanchard, Governor of Louisiana, Baton Rouge, La.:

DEAR SIR—Under instructions from you, the Board of State Engineers has made an examination of the locality on North Basin Street, between Canal Street and the harbor of the Carondelet Canal and Navigation Company, proposed to be installed and occupied by the Frisco Railroad as a Union Passenger Station, and beg leave to report as follows:

It is understood that, in reviewing conditions affecting the situation, just consideration must be given to questions governing the practical operation and handling of passenger trains at the locality, with Canal Street as a positive terminal point; that no encroachment on the site known as the St. Louis Cemetery, bounded by North Basin, St. Louis, North Liberty and Conti Streets, and as little as possible of the harbor and wharf front of the Carondelet Canal and Navigation Company and the approaches thereto, must be considered.

Observing these restrictions, it is the opinion of the Board of State Engineers that the arrangement of tracks now proposed by the Frisco Railroad at the locality described, and shown on the map submitted, cannot be materially changed, except at a serious sacrifice in reduction of station room at one end, and switching facilities at the other end of the curves, and by unadvisable encroachment upon the public thoroughfare required at the northeast corner of the St. Louis Cemetery.

The suggestion made by Your Excellency to arrange the tracks at the point where they cross the southwest corner of the harbor of the Carondelet Canal and Navigation Company, so that only one-half the number of tracks proposed so cross it, has been considered, and the following facts evolved: Such an arrangement is practicable only by reducing the distance from Canal Street to the inner ends of the curves toward Canal Street some 65 feet, and moving the other ends of the curves out toward Villere Street an equal distance. It is claimed by the railroad authorities that these departures from the present arrangement of track would greatly impair conditions for practically and safely operating passenger trains within the limits specified, and the Board of State

Engineers believes the position taken to be, under the circumstances, correct, the station room and switching facilities now designed for the locality by the railroad authorities appearing, upon careful investigation, about as restricted as could well be insisted upon to accommodate lengths of trains operated by a system of the probable extent of the one in question.

If the change suggested by you, however, were, all things considered, admissible, the area now proposed to be covered by the tracks in crossing the southwest corner of the said harbor could be reduced from about 13.2 per cent. to about 4.7 per cent. of the area of the harbor of the canal, and the length of the wharfage front obstructed by the tracks reduced from 270 feet to 160 feet. In other words, the area of the harbor of the canal unobstructed by railroad tracks is about 68,860 feet, the area to be occupied by the tracks of the railroad as now proposed by the railroad authorities is about 9,113 feet, or about 13.2 per cent. of the whole; while the area over the harbor that would be occupied by the tracks as suggested by you would be only 3,200 feet, or about 4.7 per cent. of the whole, and the wharfage front correspondingly improved about 110 feet.

Again, the area proposed to be occupied by the three outer tracks of the railroad might, if the latter were re-arranged in accordance with your suggestion, be converted into wharfage front by the construction of a wharf paralleling the tracks of the railroad so rearranged, equal in length to about 190 feet, thus reducing the present perimeter of the harbor about 80 feet instead of 270 feet.

However, the Board of State Engineers does not believe that the removal of the tracks of the Frisco Railroad from the harbor of the canal, either in part or in whole, would improve the situation of the Carondelet Canal and Navigation Company from the standpoint of material benefits to be derived. The fact is that no arrangement of tracks within the limited space permitted between the northeast corner of St. Louis Cemetery and the southwest corner of the harbor of the Carondelet Canal and Navigation Company can result in anything but virtually blockading the harbor of the canal on the west and south sides of the harbor.

The impairment of opportunity and facility for ready egress from and ingress to so large a part of the harbor of the canal, in the light of future development, cannot well be estimated at this time.

With the extension of lines of traffic in as many different im-

portant directions as New Orleans has every reason to look forward to in the near future, there is every reason to believe that the value of this canal as an artery of commerce must greatly improve and that it must eventually rank in importance with the many others already established and proposed to meet the demands of the future.

The Board of State Engineers would, therefore, respectfully suggest that the Frisco Railroad be granted the right of way covered by the tracks arranged as now proposed by it; provided, harbor room equal in area, and wharfage front equal in length and area, to that expropriated for the purposes of the railroad, be substituted at a proper locality under proper plans and specifications; that is, that the present wharfage and water area of the harbor of the canal and the perimeter of said harbor be maintained.

To this end the Board of State Engineers would designate areas on the north side of the harbor of the canal bounded by Carondelet Walk, North Basin Street, St. Peter Street and St. Claude Street, and on the west bank of the harbor of the canal at the canal entrance thereto, as a proper and satisfactory substitute for the harbor and wharfage area and front expropriated to meet the present demands of the Frisco Railroad, the harbor to be excavated, its sides revetted, and its banks provided with necessary wharves, in accordance with the plans and specifications to be prescribed by the State.

Respectfully,
The Board of State Engineers,
Per FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., October 5, 1904.

To His Excellency, Newton C. Blanchard, Governor of Louisiana, Baton Rouge, La.:

SIR—In accordance with your directions that I make a full investigation of the entrance into the City of New Orleans of the Louisiana Railway and Navigation Company over the property of the State of Louisiana known as the New Basin Canal and Shell Road, and in accordance with your further instructions that I report to you fully upon the benefits to be derived by the State prop-

erty by the passage of the railroad over same, and also the detriment, if any, to the State property by the occupancy of the said railroad, I beg to report the following as the result of my investigation:

I find that the Louisiana Railway and Navigation Company is to cross the New Basin Canal and Shell Road over a drawbridge at a point approximately 750 feet northwest of Carrollton Avenue. From there the railroad runs from Solomon Street to White Street on property not belonging to the State of Louisiana. At White Street it enters onto the State property and runs with a single track on said State property to the end of its line at South Liberty Street. This distance is approximately 6,600 feet, or about one mile and a quarter. I find that the grant of this privilege to the railroad company has been fully investigated and discussed by the Board of Control of the New Basin Canal and Shell Road, as evidenced by a number of resolutions passed by said Board; by the Attorney General, as evidenced by his draft of the resolutions of the Board of Control of the New Basin Canal and Shell Road; by the City of New Orleans, as evidenced by Ordinance No. 1997, New Council Series; and by myself, as from time to time I was called upon for advice by the Board of Control of the New Basin Canal and Shell Road.

I beg to state that, in my opinion, the existence of a trunk line on, or adjacent to, the canal property is very desirable for the State, inasmuch as this railway will induce an import and export traffic in the canal which will gradually increase the tonnage carried by the canal and, therefore, increase proportionately the revenues derived from tolls on tonnage. I, therefore, unhesitatingly report that benefit is to be derived by the State by the entrance of said railroad.

On the other hand, the passage of the railroad across the New Basin Canal and Shell Road and on the State property should be surrounded with certain safeguards in order to prevent detriment resulting to the State property. The safeguards which I would recommend, and most of which have already been considered by the Board of Control and by the City Council, are as follows:

Where the tracks cross the Shell Road on the upper bank of the canal the Shell Road should be raised so as to make a gradual approach to the grade of the tracks. This approach should have a grade not steeper than one foot of elevation in one hundred feet

of length, and should be paved and shelled as the Shell Road is now shelled. Again, gates and signals should be operated and maintained at this crossing at the expense of the railroad company, as provided for in Paragraph 1 of Section 2 of the City Ordinance.

The bridge over the New Basin Canal should be a substantial drawbridge and should have, when open, as wide a clearance as can practically be given to it, so that the tugs and ships plying in the canal will have as wide and easy a passage through this draw as can possibly be given. This is provided for by a resolution of the Board of Control, which says that the pier shall be placed as near the east bank of the canal as possible and that the drawbridge shall be operated by power, the object of this being to give as wide an opening as possible, and the operation of the bridge to be as quick as possible. Another resolution of the Board of Control says that the draw opening shall not be less than 51 feet at right angles to the canal. The minimum opening permissible by law is 50 feet.

Again, where the railroad track enters the State property at White Street to remain on said property until South Liberty Street, an alignment has been proposed by the railroad company on this property which has been submitted to the Board of Control of the New Basin Canal and Shell Road and has been approved by said Board as a desirable and practical one. The strip of land belonging to the State of Louisiana on the lower or downtown side of the canal is generally 80 feet wide. It was actually 80 feet wide when the canal was dug, but sloughing in of the banks of the canal has somewhat encroached upon this strip, and in some places, where the canal was made wider in order to permit ships to turn around, this 80 feet has been reduced down to nearly 40 feet. The alignment proposed by the railroad company on this strip and approved by the Board of Control is generally 25 feet from centre of track to lower boundary of canal property, between White Street and Claiborne Street, and generally 16 feet from centre of track to lower boundary of canal property from Claiborne Street to South Liberty Street. As the working width of a train is generally figured at 10 feet, this would mean that, measuring from canal boundary toward the canal, 30 feet would be used by the passing trains from White Street to Claiborne Street, and 21 feet would be used as train room from Claiborne Street to South Liberty Street, measuring from canal boundary towards the canal. These figures subtracted from 80 feet of canal property would leave 50 feet of un-

obstructed canal bank between White Street and Claiborne Street, and 59 feet between Claiborne and South Liberty Streets. Moreover, if the track was surfaced flush with the level of the street, which is provided for in Paragraph 3 of Section 2 of the City Ordinance, then this obstruction would exist only when trains were passing over the track, as at all other times wagons could travel or turn over the space occupied by the track. Again, the elevation of the track has been prescribed by the City Engineer and this elevation is considerably above the present level of the canal property. It would be proper, for the interest of the canal, that the ground remaining between the track and the edge of the canal should be filled to the same level as that of the track, so that there might not exist a hole between the levee on the canal bank and the railroad track. I understand that it is the intention of the railroad company to do this. Again, on account of the elevation of this roadbed or embankment, it would act as a barrier or wall preventing traffic from entering canal property where the cross streets abut against this embankment. It would, therefore, be proper that the City of New Orelans or the railroad company agree to build ramps or inclines from the level of the street to the top of the railroad embankment, wherever a street is now open to traffic and abuts against the State property. Unless this is done the railroad embankment would act as a wall or barrier preventing traffic from reaching the canal property.

It seems to me that if the above conditions are complied with, viz.:

First—To grade the Shell Road and maintain gates at bridge;

Second—To build drawbridge with maximum possible clearance;

Third—To fill space between track and levee on bank of canal to level of track;

Fourth—To maintain track flush with level of this surface, so that wagons can run over same;

Fifth—To provide ramps or inclines and crossings at all streets now open and abutting against canal property, and to build similar ramps or inclines at all other streets which may be opened in the future on said State property:

Then no detriment will result to the State of Louisiana, but on the other hand only good can result to the State property by the entrance of the Louisiana Railway and Navigation Company over its property.

Most of the above suggestions have already been considered and provided for by resolutions of the Board of Control of the New Basin Canal and Shell Road and by the City Ordinance above referred to.

Mr. Frank W. Breedlove, Chairman of the Board of Control of the New Basin Canal and Shell Road, to whom I have read this report, is thoroughly in accord with it.

Very respectfully submitted,

By ARSENE PERRILLIAT,
Assistant State Engineer,
For The Board of State Engineers.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., December 3, 1905.

To His Excellency, Newton C. Blanchard, Governor of Louisiana, Baton Rouge, La.:

DEAR SIR—In compliance with your wishes, I have examined into certain conditions in the "Caddo Gas Field" north of Shreveport, La., with special reference to the control of the "Wild Well," known as "Well No. 1 of the Producers Oil Company, of Beaumont, Texas," and beg leave to report as follows:

As you will recall, I had the honor of first visiting the gas field with you on the 4th day of last November, at which time Well No. 1 was "running wild" with gas and flame.

The special object of this visit was to determine the practicability and to estimate the cost of regaining control of this well, to guard against possible danger to propeprty and life, locally, if such were threatened, and to arrest the apparent very great waste of a most valuable natural product, the husbanding and marketing of which must mean so much to the advancement of innumerable commercial and private interests, not only in the field itself and the territory immediately contiguous thereto, but to much of the State of Louisiana and parts of Arkansas and Texas besides.

On the day of this visit Well No. 1 presented a scene of magnificent energy and surprising spectacular effect. A basin, or bowl of water, some 250 feet in diameter, had resulted from the action of the escaping gas and the roll of waves from the mouth of the orifice towards the rim of the basin like waves on a sea beach in stormy weather, from the centre of which leaped a flame some 30

feet in diameter and equally high. This, with the constant upheaval of water and leaping of spray, presented a spectacle which might readily have been likened to the display of a prismatic fountain of unusual magnitude and superb effects.

Within a comparatively short space of time, however, after this visit, and before any material conclusions could be arrived at and presented, Well No. 1 suddenly collapsed, and is now quiescent in every particular.

This was a natural result, a repetition of the history of such phenomena in other gas and oil fields, and might have been predicted with certainty in all particulars, except as to time of occurrence.

The collapse was, in general terms, brought about by the gradual failure of water to the well from subterranean sources, evaporation by heat from the flames, the steady thickening of the fluid mass in the basin from the disintegration of the more solid masses surrounding the well, resulting from the force and turbulence of the water and gas escaping, until the fluid mass was converted into a thick puddle or species of mastick, overloading the energy of the gas, and cutting off its escape from below. The possible partial obstruction of the orifice at some depth below the surface of the ground, by a dislodged bowlder or fragment of rock, or other heavy and hard substance, may also have assisted in hastening the result.

The well now presents the appearance of a circular pond, or basin, with a depressed centre and gently sloping banks, and a placid shallow pool of water about its centre, resting upon a bottom of slush or puddle.

This result seemed at the time to close the incident, and to call for no further action in the premises, but about one week ago I was again called to the field on account of the action of Well No. 2 of the same company.

While Well No. 1 was "running wild," this Well No. 2, some 100 yards away, had become, at intervals, as you will recall, beyond immediate control, "blowing off" with deafening energy, and since the subsidence of Well No. 1 it has also "blown off," but accompanied by no ignition of gas.

Well No. 2, though also decidedly formidable in appearance, does not compare with Well No. 1 in proportions, energy or intensity, and already gives signs of surrender at no very distant date to the same forces which brought about the collapse of Well No. 1.

In my opinion, and for the following reasons, Well No. 2 is a menace to neither property nor life, locally, nor to the supply of the field: The gas is nearly odorless, with a lower degree of asphyxiating effect, in its free state, than usual; the energy of the well, as a disturber of the surface of the ground, has already practically reached its limit; the flow of water from the well is perceptibly diminishing; and the percentage of the volume of gas escaping should, from a practical point of view, be inappreciable to as large a field as it is reasonable to believe exists in that section of our State.

In this connection it may be well to add that while it is true that the extent of the explorations so far made in the Caddo Gas Field, territorially speaking, have not been extensive enough to permit any one to pronounce with precision upon its magnitude and longevity, it may, in my opinion, be said that indications point conclusively to a field of unusual promise, productively and commercially.

Recurring to Well No. 2, I will add that, if local interests look upon its early control or closure as a desideratum, its accomplishment is, in my opinion, possible and practicable upon very simple lines and at comparatively no great expense—not exceeding $5,000.

I will, therefore, say, in conclusion, that if its control or closure be finally and definitely determined upon, I shall be, whenever you desire it, prepared to promptly submit plans and estimates to accomplish the work.

There are, as you know, already a number of other valuable wells in the field, all under control, capable of supplying gas for lighting and fuel purposes to an apparently unlimited extent, and mains are at this time in process of construction to so supply the City of Shreveport in the near future.

Yours very truly,

FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., April 30, 1904.

Mr. Wm. Polk, Alexandria, La.:

DEAR SIR—In reply to your inquiries, by letter of the 25th inst., and in conversation at the office here on the 29th inst., I beg leave *to say:*

The territory in Avoyelles Parish, consisting of the alluvial lands subject to overflow, bounded by Red River, the Atchafalaya River, Bayou des Glaizes, and the public road running from David's Ferry on Red River to Bayou des Glaizes, by way of Marksville, Mansura and the "Long Bridge," at Bout du Bayou, the protection of which from overflow is under consideration by you, constitutes part of the territory already included within the boundaries of the Red River, Atchafalaya and Bayou Bœuf Levee District, under the original act of incorporation of said district, which has, since 1890—shortly after the approval and promulgation of said act—and under the provisions of Section 15 of said act, been exempted from the operations of the Red River, Atchafalaya and Bayou Bœuf Levee District, so far as concerns the levying of taxes for levee purposes.

It, therefore, seems to me that one of the very first steps that should be taken in the premises is to arrange a conference with the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District to ascertain its views on the subject.

The approximate number of acres of alluvial lands subject to overflow within the area described is about 168,000.

To generally protect this area from overflow from the waters of the Red River, Mississippi River, Atchafalaya River and the Bayou des Glaizes will require a line of levee on the right bank of Red River from about David's Ferry to the head of the Atchafalaya River, thence down the right bank of the Atchafalaya River to near the mouth of the Bayou des Glaizes, and thence up the left descending bank of Bayou des Glaizes to some point near the "Long Bridge," some 125 miles in length. This line of levee may be estimated to involve the construction of not less than 5,000,000 cubic yards of earthwork (that is, on the Red and Atchafalaya Rivers about 3,500,000 cubic yards and on the Bayou des Glaizes about 1,500,000 cubic yards) and to cost not less than $750,000. Even this line of levee, however, would not necessarily protect the whole area within the boundaries described at such times as the height of the water in the Atchafalaya River might rise sufficiently to back up the Bayou des Glaizes and escape around the end of the contemplated levee at or near Bout du Bayou. This, too, without regard to the question of drainage for the area at that and other times.

More thorough and effective protection from overflow would re-

sult from a line of levee down the right bank of Red River from David's Ferry to the head of the Atchafalaya, thence down the right bank of the Atchafalaya River to and across Bayou des Glaizes, connecting with the present line of levee in the Red River, Atchafalaya and Bayou Bœuf Levee District, now extending from Simmsport south.

This would eliminate from the present project the construction of some fifty miles of levee line up the left bank of Bayou des Glaizes (estimated at 1,500,000 cubic yards or $225,000), and render no longer serviceable, except as a second line of defense, the long line of improved public levee extending along the right descending bank of Bayou des Glaizes, built and maintained by the Red River, Atchafalaya and Bayou Bœuf Levee District.

The closure of Bayou des Glaizes would then further involve provision for the drainage, from Alexandria south, now effective through Bayou des Glaizes into the Atchafalaya River. This drainage, however, might be adjusted, first, by dredging Bayou Rouge to a proper grade and section, from "The Junction" as far down Bayou Rouge as might be shown by survey to be necessary—probably to the State Canal, near the junction of Bayou Rouge with the Atchafalaya River; second, by removing the dike across Yellow Bayou on Bayou des Glaizes near Simmsport, and improving Yellow Bayou and its connections to the same point by way of the Old State Canal, back of the Winn Tract, Turner's Bayou, Bayou Jack and Bayou Rouge; and by improving the channel way from the point of junction of the two systems south and parallel to the Atchafalaya River to Bayou Courtableau.

It is difficult with the information now at hand to place an exact estimate upon the value of this work of improving drainage, but it could not well amount to less than $350,000.

The influence of this work of improving drainage in connection with the project you have in view, however, would practically redound as much to the benefit of the Red River, Atchafalaya and Bayou Bœuf Levee District generally as to the new area proposed to be protected and drained. This would come about from the fact that the influence of high water in the Atchafalaya River would thus be removed to a plane so much lower than the present one, during periods of high water, that the effect of back water would rarely, if ever, be generally felt.

In regard to the influence of the extension of the public levee

system on the Mississippi River across the Bougere Crevasse on down to the mouth of Red River, or Old River, it is recognized that it would materially reduce the elevation of high water on lower Red River, at the head of the Atchafalaya River, and on Bayou des Glaizes, and proportionately reduce the height and section of the levee lines required within these limits, and the consequent expense attached to their construction and maintenance.

Yours very truly,

FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., July 21, 1904.

To Hon. C. Harrison Parker, President, and to the Members of the Board of Control, Louisiana State Penitentiary, Baton Rouge, La.:

GENTLEMEN—In accordance with the request of your President, I visited the Angola Plantation on Friday, July 16th, together with Colonel Parker and Mr. Swigart, Superintendent of the Louisiana Railway and Navigation Company.

I inspected carefully the line which has been laid out on the premises by the Engineers of the Railroad Company, and found that to all outward appearances it conforms to the location of the line D J M N L I mentioned in the Legislative act authorizing the Louisiana Railway and Navigation Company to cross the Angola property. I am having surveys made to determine whether the line conforms exactly with the terms of this act, and also to determine whether the grade and sections prescribed by the railroad authorities conform with the terms of the same act. I will report to you on the precise details of these points as soon as the surveys are completed.

In the construction of the embankment along the line D J, where the embankment is to be the upper levee of the Angola Plantation, I notice that the proposed embankment is made an addition to the land side of the existing levee. I consider this undesirable, and would urge, if possible, that the additional earth placed on the levee be put on the river side of the existing levee.

In the construction of levees under the rules and regulations which have been found to be most efficient by long experience, the

Board of State Engineers always, where it is practicable, requires the addition to be placed on the river side of the levee, and the borrow pits made on the river side of the addition, leaving a berme or neutral ground thirty (30) feet wide between the toe of the new earth and the edge of the borrow pit. Where, for physical reasons, this is impossible, then the additional earth is placed on the land side of the levee and the borrow pits are dug also on the land side of the levee, leaving a berme or neutral ground fifty (50) feet wide between the toe of the new earth and the edge of the borrow pit. This land side enlargement, however, is only a second choice, and is only done when it is not possible to do river side enlargement.

I desire to place this matter thus in detail before you for your consideration, so that you might know which course we think it most desirable to pursue. The law does not state on which side of the levee the earth shall be placed, and it may be that the lines and confines of your property are such that you may not deem it possible or practicable to do riverside enlargement, but we desire to place the matter plainly before you as outlined above.

Very respectfully,

ARSENE PERRILLIAT,
Assistant State Engineer

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., June 9, 1904.

Hon. A. W. Crandell, Registrar State Land Office, Baton Rouge, La.:

DEAR SIR—That part of the Biennial Report of the Board of State Engineers referring to "Surveys of State Lands," about which I spoke to you at Baton Rouge yesterday, will be found on page 43, and reads as follows:

"SURVEYS OF STATE LANDS.

"Under several Acts of the Legislature of 1902 (Nos. 123, 124 and 171), it is provided that the Governor may direct the Board of State Engineers to make surveys and subdivisions necessary for identification, description, entry and sale of unsurveyed lands of the State. But as no appropriation was made for the expenses of the work, the only surveys under these acts thus far undertaken have

been, with one exception, such as parties in interest have arranged to have made without cost to the State.

"Land surveying—especially the surveying of public lands—is a distinct art, and, of course, should be done with better skill and judgment by surveyors who make it their regular business, and have local knowledge of land lines and corners in their own neighborhood, than by others; and hence the Parish Surveyors throughout the State are probably better qualified to make these surveys than any one else.

"It is to be expected that there will soon be a very large amount of such work required in the State—enough to keep the Parish Surveyors, and others also, occupied in many parishes for years to come.

"There is no apparent necessity nor any sufficient reason for putting these surveys in charge of the Board of State Engineers. It would seem reasonable that they might be made to the best advantage of the State through the direct administration of the State Land Office, though, whatever department may be put in charge of them, it is probable that the only practicable method of getting the work properly done will generally be by retaining the services of the Parish Surveyors, or other surveyors in the vicinity of the work required.

"It is, therefore, respectfully suggested that the Legislature be recommended to so amend the several acts above referred to as to put the land surveys of the State in charge of the Registrar of the State Land Office, and that sufficient appropriation be made for the work that may be required."

The views of this Board on this subject, as presented in that part of the report herein quoted, as well as the recommendation submitted, hardly need any elaboration, and leave but little for me to herein add in the way of strengthening the position taken.

The fact of the whole matter, however, is that Acts Nos. 123, 124 and 171 of the General Assembly of 1902, left as they now read, are practically inoperative. They impose upon this department a large amount of additional work of a special character without provision for meeting the expenses incident to executing it.

The only opportunity for complying with the directions of the Governor for such surveys is by agreement with parties in interest to defray the cost of surveys, as set forth in the quotation given.

The Board of State Engineers is, of course, at all times ready and willing to do all in its power to carry out the duties imposed

upon it, and is not idly complaining of this additional duty, but it does not consider this a direct nor satisfactory way at which to arrive at the best results in the premises, as you will readily appreciate.

To render these acts properly operative, no matter through which department, appropriations should be made to cover the cost of the surveys for which application is made. Should these appropriations be made available through this office, the method of procedure would undoubtedly be, if possible, to make contracts with reliable, competent and authorized surveyors engaged in such special pursuits in the locality in which the survey is called for.

This, or any other better method that would suggest itself to you, could be done by you as well if not better than by the Board of State Engineers, already overloaded with duties upon other works of public improvement in the State.

The appropriations for this department have proven during the past season not only insufficient to meet the demands upon it for work required by the levee districts, on levees, drainage, etc., but are predicated against the General Engineer Fund for work connected with levees and matters auxiliary thereto. So that, even if the amount so available were more than sufficient to cover the cost of administration of levee work, there is no authority to apply any part of it to making surveys of public lands.

It seems to me that if the acts referred to were simply amended so as to read "Registrar of the State Land Office, by contract with reliable, competent and authorized surveyors, or otherwise, to make forthwith," etc., instead of the "Board of State Engineers," the matter could be properly adjusted, and placed where it really belongs, of course, accompanied by adequate appropriations to cover the cost of the surveys.

Now, as to the fund against which the appropriation should be made, it, in my opinion, follows that the funds collected by your department from the sale of public lands are properly applicable.

In conclusion, permit me to say that I hope you may be able to see your way clear to have the recommendation of the Board of State Engineers on the subject of the "Surveys of State Lands" seriously considered and carried into effect.

I have had a bound copy of the Report of the Board of State Engineers mailed you for your information and reference, and beg *leave to* assure you that all the members of the Board, including

myself, will always take pleasure in rendering you any service and assistance in connection with this or any other matter.

Yours very truly,

FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., December 31, 1904.

Dr. J. C. Egan, Chairman and Health Officer, Shreveport Board of Health, Cooper Building, Shreveport, La.:

MY DEAR DOCTOR—In compliance with your request in letter of 20th inst., for certain information in regard to physical conditions in the lake region above Shreveport as associated with navigation between Jefferson and Shreveport and the presence of the Shreveport Water Works dam in Old River above Shreveport, I take pleasure in submitting the following:

It is a well known fact that Cypress Bayou, the head of the chain of waterways sought to be utilized for naviagtion between Jefferson and Shreveport, was not classed as a navigable stream until the advance of the Red River raft above Shreveport converted its bottom lands into what are known as Cross Lake, Soda Lake and Ferry Lake. Only during the raft period, when this lake region was at times filled by overflow from Red River, first, through bayous leading therefrom, or through canals cut to give passage around the rafts, and at the higher stages of Red River, by the over-topping of its banks, did navigation, between Jefferson and Shreveport, assume anything like what might be termed material proportions after the raft was removed, and the main volume of Red River began to follow a regular and defined channel, the bayous and abandoned canals gradually silted up, yearly lessening the supply of water to this lake region, and, finally, when the State and United States closed these bayous and canals in building and extending a public levee system, the only source of water to said lake region was derived from precipitation direct, drainage from the country contiguous and above, and back water from Red River through Cross Bayou, Old River and Twelve Mile Bayou at the foot of this lake region.

Among the bayous and the abandoned canals above referred to, which have been closed, the principal ones are as follows: Sale and

Murphy Canal, O'Rourke's Slough, Scott Slough, Hervey Canal, Red Bayou, Elmer Bayou, Dooley Bayou, Glycerine Bayou, Cowhide Bayou, Peach Orchard Bayou, Sterling Bayou and Cottonwood Bayou, the embankments across which now constitute valuable and necessary links in a chain of substantial levees, protecting a large and fertile section of the State of Louisiana. This building and extending of the public levee system of the State, involving the closure of these bayous and abandoned canals, has lowered the bed of Red River generally not less than 15 feet, and its low water levels proportionately, and produced a comparatively corresponding lowering of all water levels and lines of moisture in the lake region referred to. The accompanying profile, compiled from surveys made by the United States Government, shows generally the controlling elevations to be found between Shreveport and Ferry Lake, along a route through Red River, Old River, Twelve Mile Bayou, Albany Flats, Soda Lake, Big Willow Pass and Ferry Lake. From this the impossibility of water supplied under present conditions from Red River through Cross Bayou, Old River and Twelve Mile Bayou, at the foot of the basin, affording navigation to any sort of craft under a stage of 25 feet on the gauge at Shreveport, or 186.2 C. D., is manifest.

Now in regard to the Shreveport Water Works Dam itself:

As a matter of fact the Shreveport Water Works Dam is not located in Twelve Mile Bayou, but in the lower arm of Old River, the mouth of Twelve Mile Bayou being in the upper arm of Old River, some 1½ miles above the dam.

Its effect, if any, upon the lake region and old waterways above, is to improve stages of water in Twelve Mile Bayou, between Albany Flats and the dam, by holding back any water coming from that direction, up to an elevation equal to the crest of the dam, or 10 feet on the Shreveport gauge, after which it simply becomes a waste weir. Its effect on water backing up from Red River, through Old River, is simply to retard such water from readily reaching Twelve Mile Bayou up to a stage also equal to the elevation of the crest of the dam; namely, 10 feet on the gauge at Shreveport.

Such a stage, 10 feet on the gauge at Shreveport, derived from that direction, would only reach a point in Twelve Mile Bayou, near Albany Flats, about 14 miles above the dam, following the meanderings of lowest elevations, and would then be 14 feet below the bed of the lake above.

Beyond the drainage water flowing down through the lakes and Twelve Mile Bayou, in small or large proportions, dependent upon the seasons of the year, the only material source of water for Twelve Mile Bayou, at this time, is derived from water backing up Red River through Cross Bayou and Old River. Assuming that the water from Red River would back up on a level with the elevation at which it enters the lower end of the basin, already described, a result dependent to a greater or less degree on local conditions in the basin, it would require a stage of not less than 24 feet on the gauge at Shreveport, or 185.2 C. D., to reach the bottom of the bed of Soda Lake at or near Albany Flats. Such an elevation would be about 14 feet above the crest of the Shreveport Water Works Dam, certainly sufficient to permit any craft drawing only something less than that depth of water to start to Jefferson, Texas, but most assuredly stick in the mud at Albany Flats. Any stage lower than that, dam or no dam, need not be considered in the light of navigation to Texas above that point, and at any stage *over* it the presence of the dam would long before have ceased to be considered in the premises by intelligent persons.

Another condition in Twelve Mile Bayou appears to be assuming shape that may further demonstrate that the present Shreveport Water Works Dam, under existing conditions and developments, need not be regarded as a serious factor in affecting the question of navigation between Jefferson and Shreveport, and this is the fact that, during the high water in Red River in 1903, the neck of land separating Red River from Twelve Mile Bayou, at a point about opposite Colquitt's Bend, some 6 miles above Shreveport, and about 4 miles above the dam, was breached through by caving, practically transferring, at certain stages of water, the mouth of Twelve Mile Bayou from the upper arm of Old River to Red River proper at the point at which this breach occurred.

No project short of one involving either a series of locks and dams, or re-rafting or daming up Red River, or the leveling down and destruction of the public levee lines along the banks of Red River in that section, thereby once more converting the lake region into an abandoned country, or the excavation of a new river from Jefferson, Texas, to Shreveport, Louisiana, to depths permitting the low stages of Red River at Shreveport to back up unimpeded and uninterrupted to that point, can, in my opinion, ever again promise

navigation between Jefferson and Shreveport, and then only spasmodically and in a negative way. When you consider the loss of property involved in the one case, and the magnitude of the work required in the other, it does not seem rational to expect such plan ever to materialize.

I also send you a map of the lake region above Shreveport, in two sheets, with the general topography of the region shown thereon, and numerous elevations of surface, which should materially aid you in making out your case before the proper authorities.

I also send you a copy of the biennial report of the Board of State Engineers, from April 20, 1900, to April 21, 1902, in which you will find on pages 126 and 127, marked, a copy of a report to the Honorable W. F. Taylor, President Board of Commissioners, Caddo Levee District, relative to the Shreveport Water Works Dam, which, by deduction, should have considerable bearing upon the subject.

In regard to the effect of the presence of the dam upon the water supply at Shreveport, your personal knowledge and observations of all the facts connected therewith should need no strengthening argument on my part, besides which the Shreveport Water Works Company itself should be far better able to aid you in regard to this than I can possibly be without further investigation.

I hope the facts herein presented to you may prove of some service, and any further assistance I can render you, you have but to request. With regard, believe me,

Yours very truly,

FRANK M. KERR,
Chief State Engineer.

STATE OF LOUISIANA,
OFFICE BOARD OF STATE ENGINEERS,
NEW ORLEANS, LA., January 17, 1906.

Mr. L. H. Birch, Marksville, La.:

DEAR SIR—Your letter of the 11th instant, relative to recent high water conditions on Red River in the vicinity of and opposite the Avoyelle Prairies, and down the river to Barbin's Landing, with certain suggestions for relief, and asking me to use my influence in having a bill passed by Congress to effect this relief in the manner described—that is, by making certain cut-offs—has been received.

You may be very sure that any measure which would *insure* this relief to the section of your parish suffering from overflows, as described, would command my instant attention and most earnest and active approval and coöperation.

I regret to say, however, that the project outlined in your letter for doing this does not appeal to me as an engineer nor as a public officer. On the contrary, while faith in the cut-off, as an adjuster of certain conditions in streams, is a popular theory to the average layman, it is known to anyone at all experienced in the control of rivers and floods to be not only fallacious, but a snare and a delusion, leading ultimately to results more serious and complicated than those of which complaint is made. The remedy proposed by you is made dependent upon successfully effecting two considerable cut-offs in the course of Red River, and cut-offs are properly classed by all authorities on the subject as disastrous disturbers of the regimen of a river, which should, beyond all question, be not only discouraged, but opposed in the most strenuous way provided by law. They cause rapid bank caving for long distances above and below, destroying neighboring property and injuring the channel of the river.

That the tortuousness of Red River in the vicinity of the proposed cut-offs is entirely responsible for the "backing up" of the water cannot be admitted by me, nor is the fact borne out when you consider conditions on Red River, along the Caddo and Bossier Parish fronts, where, since the confinement of the waters of Red River to the main channel by means of levees, flood levels are noticeably lowering, due to the deepening and widening of the stream, without any material shortening of the river, nor departure from its original meanderings—notable as they were and still are.

Again, you must remember that the slope of Red River from Alexandria to its mouth is directly influenced by the stage of water in the Mississippi River, and any shortening of the distance, if practicable, between Barbin's Landing and the mouth of Red River, to steepen the slope, and increase the flow of water during comparatively low stages in the Mississippi, would make that part of Red River just that much more sensitive to back water from the Mississippi, when the latter was at any flood stage, and induce correspondingly earlier local flood conditions.

You will, therefore, readily understand that with these facts before me, and entertaining the views herein expressed, I could not

be expected to advocate the project advanced by you in the premises.

The practical and ultimately successful and satisfactory remedy for the evils set forth will be found to lie in the construction of comprehensive systems of levees down both banks of Red River.

A system to protect the alluvial lands subject to overflow on the right descending bank of Red River, below the Avoyelles Prairies, has already been commenced under the auspices of the Red River and Bayou des Glaizes Levee and Drainage District, and should reach an effective stage within the course of another season, and will, no doubt, be extended and improved within the near future.

It also seems reasonable to expect that steps will sooner or later be inaugurated to consider the protection of the lands on the left descending bank in a similar way, and any service I can possibly render in that direction may be fully relied upon.

Respectfully,

(Signed) FRANK M. KERR,

Chief State Engineer.

APPENDIX C.

STATEMENTS RELATIVE TO HIGH WATER RECORDS.

St.	3	Highest since 1871.	
Miss	une.1.	23.60	1881
	nel.2	35.00	1903
Up Mis	ine 10	38.00	1903
	ch 1	31.80	1884
O	ch.5.	71.06	1884
	ch.9.	46.60	1884
Cum	ch.9	55.30	1882
Tenn	l. 11.	54.00	1875
	h15,17	52.20	1883
Miss	h 20	40.10	1897
	h26,27	51.75	1897
	h28,29	53.70	1903
Ark	ay26	35.00	1898
	ne 2	31.20	1892
	h27,28	52.90	1903
	h.27	49.10	1903
Miss	h.27	46.48	1903
	h 28	52.48	1897
	h 28-30	50.35	1903
	ch 14	35.75	1876
Re	h 22	35.70	1892
	ch 28	38.25	1892
Atch	1.7.11	50.95	1897
	1 4.5	38.70	1903
	1.8 9	50.20	1897
	7.8.10	40.65	1897
Mis	5,7.8	36.25	1897
	1 7.	32.75	1897
	1.5.6	27.95	1897
	1.5.6	19.42	1903
	h 27	8.05	1903

ississippi River),
ineers
ns, Apl. 1906.

St.	3	Highest since 1871.	
Miss	une.1.	23.60	1881
	ne1.2	35.00	1903
up Mis	ine 10	38.00	1903
	ch 1	31.80	1884
O	ch.5.	71.06	1884
	ch.9.	46.60	1884
Cum	ch.9	55.30	1882
Tenn	l. 11.	54.00	1875
Miss	h15.17	52.20	1883
	h 20	40.10	1897
	h26,27	51.75	1897
	h28.29	53.70	1903
Ark	ay26	35.00	1898
	ne 2	31.20	1892
Miss	h27.28	52.90	1903
	h.27	49.10	1903
	h.27	46.48	1903
	h 28	52.48	1897
	h 28.30	50.35	1903
Re	ch 14	35.75	1876
	h 22	35.70	1892
	ch 28	38.25	1892
Atch	l.7.11	50.95	1897
	l 4.5	38.70	1903
Mis	l.8 9	50.20	1897
	.7.8.10	40.65	1897
	5,7.8	36.25	1897
	l 7.	32.75	1897
	l.5.6	27.95	1897
	l5.6	19.42	1903
	h 27	8.05	1903

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Datum", a 1905 and

h Highe

of 1905 Low Water

e ng	Elevation C. D.	Date	Gaug Readi
0	329.34	eb'y 4	8.
0	232.97	,, 9	2.
0	199.78	,, 10	4.
0	159.44	,, 10-12	5.
0	126.02	,, 12-13	1.9
0	106.84	an'y 1	2.9
0	78.19	,, 1	6.0
0	64.57	,, 1	5.8
0	57.75	,, 1	0.8
0	50.58	,, 1	2.9
0	47.64	,, 1	1.1
0	43.49	,, 1	1.7
0	34.07	,, 1	0.2
0	276.18	an'y 6,7	4.3
0	194.79	,, 10,11	0.6
0	99.98	ct 23,24	2.8
0	64.31	ct 25,26	9.0
0	54.20	,, 25	11.3

of Board of State

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APPENDIX D.

MAP SHOWING GEOGRAPHICAL POSITION OF THE LEVEE DISTRICTS OF LOUISIANA AND OF PART OF ARKANSAS, APPROXIMATE LOCATION AND LENGTHS OF LEVEE LINES IN EACH AND OTHER INFORMATION OF A STATISTICAL CHARACTER.

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APPENDIX E.

LIST OF ACTS OF THE GENERAL ASSEMBLY OF THE STATE OF LOUISIANA FROM 1876 TO 1906 AND ARTICLES OF THE CONSTITUTION OF THE STATE, RELATIVE TO LEVEES, DRAINAGE,, ROADS, ETC., AND THE DUTIES OF THE BOARD OF STATE ENGINEERS.

APPENDIX E.

SESSION OF 1877.

Act 6. Asking aid of the National Government to rebuild and repair levees.

EXTRA SESSION OF 1877.

Act 46. Relative to Fordoche and Grosse Tete Levee District, amending Act 78 of 1876.

Act 47. Making appropriations for expenses of State.

Act 97. Relative to the duties of the Board of State Engineers with regard to the Barataria Ship Canal.

Act 117. Duties of the Board of State Engineers relative to removing obstructions at mouth of Red River.

Act 121. Amending Section 14 of Act 46 of 1877, Extra Session, relative to Fordoche and Grosse Tete Levee District.

Act 139. Repealing Acts creating the Louisiana Levee Company.

Act 140. Repealing the previous Acts constituting a State Board of Engineers, and providing for the creation of a new Board of Engineers, and vesting the control of levees in the Police Juries.
Amended by Act 69 of 1878.
Repealed by Act 5 of 1878, Extra Session.

Act 76. Providing for a hydrographic and topographic survey of Bayou Bœuf by State Engineers.

Act 119. State Engineers to make a hydrographic and topographic survey of Bayou Teche, commencing at Iberia and extending to the junction of said stream with the Courtableau.

SESSION OF 1878.

Act 1. Requesting aid for levees from Congress.

Act 9. Authorizing the Board of State Engineers to use certain funds reserved by Act 139 of 1877. Also providing for traveling expenses of Board.

Act 31. Authorizing the Governor to appoint a commission with regard to forming a levee district from the mouth of Arkansas River to mouth of Red River.

Act 69. Amending Section 6, Act 140, of 1877, Extra Session, relative to payment of levee work.

Act 83. Ordering State Engineers to survey Bayou Gresse Tete.

Act 86. Relative to connection of Board of State Engineers with Plaquemines Parish Canal Company.

EXTRA SESSION OF 1878.

Act 3. Appropriations for expenses of State.

Act 5. Repealing Act 140 of 1877, Extra Session. Creating a new Board of State Engineers. Creating levee districts and levee commissioners therefor. Imposing district taxes on land and on products. Giving control of levees to Police Juries. Providing for the closing of Bonnet Carre.

Repealed by Act 33 of 1879.

SESSION OF 1879.

Act 14. Appropriations for expenses of State.

Act 33. Repealing Act 5, of 1878, Extra Session. Creating new Board of State Engineers. Ordering the levy of a one mill tax all over the State—known as the General Engineer Fund. Reorganizing the various levee districts, limiting district taxation to a five mill ad valorem tax on real estate. Giving control of levees to Police Juries.

Amended by Act 44 of 1886 creating Fifth Louisiana Levee District.

Amended by Act 97 of 1890, creating Atchafalaya Basin Levee District.

Amended by Act 13 of 1892, creating Lafourche Basin Levee District.

Amended by Act 14 of 1892, creating Lake Borgne Levee District.

(See Acts 99 of 1882 and 48 of 1884.)

CONSTITUTION OF 1879.

Article 204. Ordering taxation for levee purposes.

Article 213. Ordering maintenance of levees, and authorizing levy of a tax not to exceed one mill. Reaffirmed in Constitution of 1898.

Article 214. Authorizing creation of new levee districts; limiting district taxation to five mills. Amendment proposed by Act 112 of 1884. Carried by election of April 17, 1888. Made operative by Act 8 of 1888.

Article 215. Canceling Articles 213 and 214 when Federal Government shall have taken charge of levees, and giving freedom of action to Mississippi River Commission.

Article 216. Authorizing creation of levee districts partly in other States.

Article 3. Miscellaneous ordinances for relief of taxpayers. Relative to Levee Company Warrants.

SESSION OF 1880.

Act 71. Appropriations for expenses of State.

Act 88. Providing for protection of levees by Police Juries, also defining how levees can be cut for rice flumes, etc. Amended by Act 104 of 1882.

Act 102. Transferring levee and drainage money to General Engineer Fund.

EXTRA SESSION OF 1881.

Act 5. Appropriations for expenses of State.

SESSION OF 1882.

Act 2. Joint Resolution asking Congress aid for building levees.

Act 10. Constituting the construction and maintenance of levees works of public improvement.

Act 41. Enabling Police Juries, except that of Orleans, to levy an annual rate of taxation to carry on works of public improvement.
(See Act 126 of 1892.)

Act 55. For relief of Mrs. Hardee, widow of ex-chief State Engineer.

Act 56. Authorizing relief to overflow sufferers out of Levee and Drainage Fund.

Act 59. Providing for the reassessment of overflowed land or other overflowed property.

Act 63. Making appropriations for State expenses.

Act 73. Relative to distribution of funds for levee purposes—known as General Engineer Fund.
Amended by Act 83 of 1884.

Act 97. Authorizing the Fordoche and Grosse Tete Special Levee District Company to issue bonds.

Act 99. Authorizing the appointment of an additional State Engineer.
Amended by Act 48 of 1884.

Act 104. Amending Sections 3, 10, 11, 12 and 14 of Act 88 of 1880, relative to protection of levees by Police Juries and their cutting for rice flumes.
Repealed by Act 84 of 1884.

Act 126. Prescribing how to hold special elections for the levying of special taxes for works of public improvement, etc.
(See also Act 41 of 1892.)

SESSION OF 1884.

Act 7. Relative to straightening streams, making cutoffs, etc.

Act 12. Relative to transfers from Levee and Drainage Fund to General Engineer Fund.

Act 20. Prohibiting collection of district levee taxes in the Fifth Municipal District, Parish of Orleans.

Act 26. Creating Tensas Basin Levee District.
Repealed by Act 59 of 1886.

Act 33. Appropriation for Mill Bayou Culvert, in Avoyelles Parish.

Act 48. Amending Act 99 of 1882 and authorizing appointment of two additional State Engineers.

Act 52. General appropriation bill.

Act 59. Relative to postponement of payment of taxes, years of overflow.

Act 83. Amending Act 73 of 1882, relative to distribution of General Engineer Fund.
Amended by Act 60 of 1886.

Act 84. Repealing Acts 88 of 1880 and 104 of 1882, prescribing for care and preservation of levees by Police Juries, and for their cutting for rice flumes.
Amended by Act 112 of 1886.

Act 85. Authorizing contract with James & McGinty for construction of levees.

Act 112. Proposing amendment to Article 214 of Constitution, by providing a limit of ten miles for district taxation and stating how more can be levied.
Carried by election April 17, 1888. See Act 8 of 1888.

Act 123. Concurrent Resolution requesting Mississippi River Commission to adopt plan to prevent banks from caving.

Act 124. Transferring funds to Caddo and Natchitoches subdistricts and to Tensas Basin Levee District.

SESSION OF 1886.

Act 8. Inviting Arkansas Levee Commissioners to confer with Louisiana Legislative Committee.

Act 44. Amending Act 33 of 1879 and creating Fifth Louisiana Levee District.
Amended by Act 16 of 1890.
Amended by Act 4 of 1892.
Amended by Act 48 of 1894.
Amended by Act 11 of 1898.
Amended by Act 5 of 1902.
Amended by Act 6 of 1902.

Act 47. Appropriations for expenses of State.

Act 48. Authorizing the Board of State Engineers to survey. stake out and make estimate of the cost of certain levees to protect alluvial lands of the State. Morganaza Levee and Diamond Island Bend Levee.

Act 58. To re-establish drainage of Bayou Fontaine, Parish of East Baton Rouge, and make an appropriation therefor.

Act 59. Repealing Act 26 of 1884, creating the Tensas Basin Levee District.
Amended by Act 77 of 1888.
Amended by Act 103 of 1892.
Amended by Act 70 of 1894.
Amended by Act 117 of 1898.

Act 60. Amending Acts 83 of 1884, and 73 of 1882, relative to distribution of General Engineer Fund.
Amended by Act 102 of 1892.

Act 78. Relative to manner of building levees across sloughs.

Act 79. Authorizing certain taxes, due by the V. S. & P. R. R., to be placed to the credit of Fifth Louisiana Levee and Tensas Basin Levee Districts, and authorizing Parishes of Ouachita, Richland and Madison to appropriate certain money to Fifth Louisiana Levee District for levee purposes.

Act 103. Creating the Atchafalaya and Bayou de Glaise Special Levee Districts in Parishes of St. Landry and Avoyelles, provided it be ratified by public election.
Lost by election of October 4, 1886.

Act 112. Amending Acts 88 of 1880, and 104 of 1882. Exempting certain parts of certain parishes from rice flume prescriptions included in above acts.

Act 118. Authorizing Fifth Louisiana Levee District to build levees in Arkansas.

SESSION OF 1888.

Act 8. To carry into effect Article 214 of the Constitution, as amended at general election of April 17, 1888, provided for by Act 112 of 1884.

Act 39. Instructing State Board of Engineers to survey New Basin Canal.

Act 45. Authorizing transfer of certain moneys in General Engineer Fund to the credit of 1878 fund.

Act 48. Appropriations for expenses of State.

Act 67. Authorizing certain Police Juries to erect back and side levees as protection against tidal water.

Act 77. Amending Act 59 of 1886, and repealing Act 26 of 1884. Relative to Tensas Basin Levee District.

Act 80. Providing for disposition, etc., of property bid in for and adjudicated to the State for taxes for 1880 and subsequent years.
Amended by Act 126 of 1896.

Act 85. Section 89, levying one mill tax for General Engineer Fund.
Amended by Act 178 of 1894.

Act 108. Prohibiting riding and driving over the public levees.

Act 117. Relative to expenses of accounts required to keep levee funds.

Act 144. Appointing a Board of Control for the New Basin Canal, and fixing duties of Board of State Engineers with regard to the same.
Amended by Act 82 of 1896.
Amended by Act 10 of 1894.

SESSION OF 1890.

Act 1. Concurrent resolution affirming efficacy of levee system, and condemning outlets.

Act 2. Concurrent resolution thanking Captain Dan. C. Kingman, United States Engineer, for his efficient levee service.

Act 16. To amend and re-enact Sections 4 and 5 of Act 44 of 1886, relating to Fifth Louisiana Levee District.

Act 23. (Joint resolution.) Instructing the Board of State Engineers to cause to be removed from the base of all levees, hereafter to be made, all stumps, trees, logs, roots, and other matter susceptible to decay.

Act 36. Prohibiting Register of Conveyances of Orleans from reporting on his certificates any adjudication of real-estate to the State for levee taxes of 1880 and 1881, situated in the Fifth District of Orleans.

Act 60. Making it unlawful for live stock of any description to go on the levees during high water.
Amended by Act 46 of 1894.

Act 79. Creating the Red River, Atchafalaya and Bayou Bœuf Levee District.
Amended by Act 46 of 1892.
Amended by Act 62 of 1894.

Act 80. Authorizing corporations or boards of public works to borrow money.
Amended by Act 93 of 1894.

Act 82. Appropriations for expenses of State.

Act 93. Creating the Orleans Levee District.
Amended by Act 79 of 1892.
Amended by Act 116 of 1898.
Amended by Act 145 of 1900.

Act 95. Creating the Pontchartrain Levee District.
Amended by Act 68 of 1892.
Amended by Act 59 of 1894.
Amended by Act 96 of 1894.
Amended by Act 95 of 1900.
Amended by Act 4 of 1904.

Act 96. Duties of Board of State Engineers with regard to the drainage of Bayou Pierre.

Act 97. Creating the Atchafalaya Basin Levee District, and repealing a portion of Act 33 of 1879. Amended by Act 140 of 1902.

Act 125. To authorize the Board of Levee Commissioners of the Fifth Louisiana Levee District to issue bonds in place of certain bonds that have been lost or stolen.

Act 144. To regulate manner in which pipes shall be placed in levee and removal of rice dahls, flumes or conduits. Prohibiting cutting of public levees.
Annulled by Act 5 of 1892.

SESSION OF 1892.

Act 1. Transferring $10,000 from the Levee and Drainage Fund to the Fifth Louisiana Levee District Fund.

Act 4. To amend and re-enact Section 9 of Act 44 of 1886, creating the Fifth Louisiana Levee District.

Act 5. Prohibiting the placing of rice flumes, dahls, pipes, or other foreign substances in levees, and requiring Police Juries to cause such existing conduits to be removed before January, 1893.
Annuls Act 144 of 1890.
Amended by Act 62 of 1892.

Act 13. Creating the Lafourche Basin Levee District and amending Act 33 of 1879.
Amended by Act 100 of 1892.
Amended by Act 19 of 1894.
Amended by Act 175 of 1894.

Act 14. Creating the Lake Borgne Basin Levee District, and amending Act 33 of 1879.

Act 16. Prohibiting the placing of obstructions on levees, such as lumber, building material, fuel, fences, buildings, constructions, etc., and the tying of logs to levees.

Act 35. Creating a high water emergency fund of $30,000 during the high water of 1892.

Act 41. Authorizing the Board of Commissioners of the Orleans Levee District to levy a special tax for the year 1892, in accordance with existing laws, to indemnify the owners of certain property appropriated, damaged or destroyed for levee purposes. See Act 25 of 1894.

Act 46. Amending and re-enacting Act No. 79 of 1890, creating the Red River, Atchafalaya and Bayou Bœuf Levee District.
Amended by Act 49 of 1900.

Act 47. Appropriations for general expenses of State.

Act 53. Appropriating $1,500 for the relief of Thomas O'Malley for the loss of tools, etc., on levee work in the Parish of Pointe Coupee.

Act 62. To amend Act No. 5 of 1892, prohibiting rice flumes, dahls, pipes and other foreign substances in the public levees, and to regulate the use of syphons for irrigation and other purposes.
Amended by Act 196 of 1898.

Act 68. To amend and re-enact Section 7, of Act 95, of 1890, relative to creating Pontchartrain Levee District.

Act 74. Creating the Caddo Levee District.
Amended by Act 90 of 1894.
Amended by Act 142 of 1900.
Amended by Act 160 of 1900.

Act 79. To amend and re-enact Section 6 of Act 93, approved July 7, 1890, entitled an Act to establish the Orleans Levee District, etc.
Amended by Act 140 of 1900.

Act 83. Authorizing Auditor to warrant on various district funds to pay for increased expense of keeping accounts for said funds.

Act 89. To create the Bossier Levee District.
Amended by Act 104 of 1894.

Act 91. Requesting the Governor to instruct the Board of State Engineers to make a survey of the I. C. R. R. embankment to determine whether it interferes with natural drainage of crevasse water.

Act 98. Designating the distance from levee for irrigating lands, prohibiting cutting of levees, regulating the use of syphons, etc.

Act 100. To amend and re-enact Section 1 of Act No. 13 of 1892, creating the Lafourche Basin Levee District.
Amended by Act 175, of 1894.

Act 102. Amending and re-enacting Act 83 of 1884, and Act 60 of 1886, and providing for the distribution of the General Engineer Fund.

Act 103. Amending Act 59 of 1886, creating the Board of Commissioners for the Tensas Basin Levee District.

Act 110. To encourage, protect and regulate the oyster industry, etc. The Board of State Engineers to furnish maps of shore lines, etc., of each of said parishes, to Police Juries of said parishes.
Amended by Act 121 of 1896.

SESSION OF 1894.

Act 10. Fixing the term within which sworn statements to obtain postponement of payment and collection of taxes on account of overflow and other causes, shall be made and filed.

Act 18. Creating the Buras Levee District.
Amended by Act 80 of 1898.
Amended by Act 97 of 1898.

Act 19. To amend and re-enact Section 9 of Act 13 of 1892. (Lafourche Basin Levee District.)

Act 25. Authorizing Orleans Levee District to pay over to such persons whose property has been expropriated in accordance with Act 41 of 1892.

Act 26. Authorizing Police Juries to work Parish prisoners on roads, levees, public works, etc., under certain conditions.

Act 36. Requiring all State and District Boards, State and District Officers, to file with Auditor of Public Accounts itemized detailed semi-annual reports.
Amended by Act 175 of 1904.

Act 46. Making it a misdemeanor for any person, whether the owner or not of any horse, mule, cattle, etc., impounded under the provisions of Act No. 60 of 1890, to go on levees, etc., and amending Act 60 of 1890.

Act 48. To amend and re-enact Section 10, Act 44 of 1886 (Fifth Louisiana Levee District); levying special assessment, collection, etc., and ordering Board of State Engineers to make a survey of Bougere Crevasse.
Amended by Act 11 of 1898.

Act 51. Making it unlawful for the City of New Orleans and others to drain into New Basin Canal.

Act 59. Authorizing the Board of Commissioners for the Pontchartrain Levee District to issue and negotiate $1,000,000 bonds. Amending Act 95 of 1890.

Act 62. Authorizing the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District to build a culvert at the mouth of Mill Bayou. Referring to Act 79 of 1890.

Act 65. To secure more effective collection of the special assessment and forced contributions of levee boards, etc.

Act 70. To amend and re-enact Section 10 of Act No. 59 of 1886 creating the Tensas Basin Levee District.

Act 82. Appropriations for general expenses of State.

Act 90. To amend Act 74 of 1892 (Caddo Levee District) and more fully designate what lands shall be subject for taxation for levee purposes, etc.

Act 93. Amending Act 80 of 1890, relative to corporations engaged in construction of public works, levees, etc.

Act 96. To amend Act 95 of 1890 (creating Pontchartrain Levee District) with regard to the ownership of public lands.

Act 104. To amend Act 89 of 1892 (Bossier Levee District) and more fully designate what lands shall be subject to taxation for levee purposes.

Act 110. Creating Cat Island Levee District.

Act 131. Authorizing the Parish of Concordia, through its Police Jury, to issue bonds for levee purposes, etc.

Act 175. To amend and re-enact Section 1, Act 100 of 1892, Section 1, Act 13 of 1892, Lafourche Basin Levee District.
Amended by Act 59 of 1904.

Act 178. Amending Act 85 of 1888, and providing for the levying of the one mill tax for General Engineer Fund.

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Act 20. Recommending to the consideration of the Atchafalaya Basin Levee District the use of Sewall dykes in the Bayou Goula Bend.

Act 26. Making appropriations for the general expenses of State.

Act 39. Making appropriations out of the General Engineer Fund to pay counsel fees in the case of William B. Eldridge vs. The Board of State Engineers and Peter J. Trezevant, contractor.

Act 48. Authorizing the Board of State Engineers to examine the Baptiste Collette Canal, and to close same under certain contingencies.

Act 52. Section 1 calling for a Constitutional Convention and imposing certain limitations, among which, one on the subject of levee laws.

Act 82. Amending Section 12 of Act 144 of 1888, with regard to the New Basin Canal and Shell Road.

Act 121. Repealing and re-enacting Act 110 of 1892, to protect the oyster industry.

Act 126. Amending and re-enacting Section 3, Act 80 of 1888, exempting levee board lands from provisions of the Act of 1888 with regard to public tax sales.

SESSION OF 1898.

Act 10. Concurrent Resolution. No Levee Commissioner, officer, or employees, directly or indirectly, to be interested in any levee work.

Act 11. Amending and re-enacting Section 10 of Act 48 of 1894, authorizing Fifth Louisiana Levee District to levy a special assessment, and ordering Board of State Engineers to make a survey of Bougere Crevasse.

Act 14. To carry into effect Article 239 of the Constitution, authorizing the Boards of Commissioners of the various levee districts of the State to issue bonds for the purpose of refunding outstanding bonds.

Act 15. Concurrent Resolution. Memorializing Congress relative to the construction of a system of locks and dams in the Ouachita River.

Act 17. Concurrent Resolution. Memoralizing Congress to appropriate $15,000 to remove drift from Bayou Courtableau.

Act 21. Authorizing the Police Juries to cut ditches and canals through private property for the purpose of draining the public roads.

Act 24. Creating the Grand Prairie Levee District.
Amended by Act 41 of 1900.
Amended by Act 43 of 1900.
Amended by Act 18 of 1902.

Act 27. Concurrent Resolution. Memorializing Congress to construct locks in Bayou Lafourche.

Act 55. Appropriations for general expenses of State.

Act 79. Authorizing Orleans Levee Board to levy a special tax for the year 1898, to indemnify the owners of certain property expropriated.

Act 80. Amending and re-enacting Section 10 of Act 18 of 1894, relative to Buras Levee District.

Act 97. Authorizing the Buras Levee Board to issue $25,000 of bonds. (See also Act 18 of 1894.)

Act 116. Authorizing the Orleans Levee District to issue $500,000 of bonds. (See also Act 79 of 1892.)

Act 117. Amending and re-enacting Sections 3 and 4 of Act 59 of 1886, relative to Tensas Basin Levee Board.
Amended by Act 20 of 1900.

Act 196. Amending and re-enacting Act 62 of 1892, relative to rice flumes, dahls, etc.

CONSTITUTION OF 1898.

Art. 191. No member of the General Assembly, or public officer, or person elected or appointed to a public office, to demand or accept, for his own use, or for the use or benefit of another, any free pass, free transportation, etc.

Art. 195. New Basin Canal and Shell Road and Carondelet Canal and Shell Road not to be leased or alienated after coming into possession of State.

Art. 238. Authorizing levy of a one mill tax on all property in the State, to be applied exclusively to the maintenance of a levee system. (General Engineer Fund.)

Art. 239. Authorizing the General Assembly to divide the State into levee districts, provide for the appointment or election of the Levee Commissioners, etc.; authorizing

the Boards of Levee Commissioners, with the consent of the Board of State Engineers, to enter into contracts with steam railroads to operate on the public levees; authorizing the Boards of Commissioners of the several levee districts, for the purpose of refunding outstanding bonds, to issue new bonds in lieu thereof.

Art. 240. Authorizing Federal Government to make such surveys within the State as may be necessary to carry into effect the Act of Congress creating the Mississippi River Commission.

Art. 241. Authorizing the General Assembly, with the concurrence of adjoining State or States, to create Interstate Levee District.

Art. 281. Prescribing how Municipal Corporations, Parishes and Drainage Districts, the Parish of Orleans excepted, may incur debt and issue negotiable bonds therefor, and levy an annual tax to carry on works of public improvement.

Art. 290. Permitting riparian owners of land on navigable rivers, lakes, etc., to construct on banks or battures owned by them buildings, wharves, etc., under certain conditions.

Art. 294. Board of State Engineers, whenever called upon so to do, to furnish the different road districts with such plans, specifications, etc., as will tend to create a uniform system of public roads throughout the State.

Art. 312. Giving right of action to owners of expropriated property against Orleans Levee District.

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Act 5. To carry into effect Article 281 of Constitution of 1898, authorizing municipal corporations, parishes and drainage districts, the City of New Orleans excepted, to incur debt and issue negotiable bonds therefor, and to levy and assess special taxes; and prescribing how propositions for this purpose shall be submitted and voted on by the property taxpayers within said district, municipal corporation or parish.

SESSION OF 1900.

Act 9. Authorizing the Board of Commissioners of the Lafourche and Atchafalaya Basin Levee Districts to construct locks at the head of Bayou Lafourche.

Act 12. Relative to the organization of drainage districts in the parishes of the State—Orleans excepted.
Amended by Act 159 of 1902.

Act 20. Amending and re-enacting Act 117 of 1898, relative to Tensas Basin Levee District.

Act 41. Authorizing the Board of Commissioners of the Grand Prairie Levee District to issue $5,000 bonds.
(See also Act 24 of 1898.)

Act 43. Amending and re-enacting Act No. 24 of 1898, relative to Grand Prairie Levee District.
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Act 49. Authorizing the Board of Commissioners of the Red River, Atchafalaya and Bayou Bœuf Levee District to issue $250,000 of additional bonds.
(See also Act 46 of 1892.)

Act 56. General appropriation bill.

Act 70. Creating the Board of Control of the State Penitentiary.
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Act 95. Amending and re-enacting Act 95 of 1890, relative to the Ponchartrain Levee District.

Act 114. Prescribing manner in which municipalities, parishes and drainage districts may incur debts and issue bonds.

Act 140. Amending and re-enacting Act 79 of 1892, relative to Orleans Levee District.

Act 142. Authorizing the Board of Commissioners of the Caddo Levee District to issue $100,000 of additional bonds.
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Act 145. Amending and re-enacting Act 93 of 1890, relative to Orleans Levee District.

Act 152. Making it unlawful to place obstructions to navigation in Lake Ponchartrain, at the mouth of the New Basin Canal.

Act 160. Amending and re-enacting Sections 1 and 9 of Act 74 of 1892, relative to the Caddo Levee District.

SESSION OF 1902.

Act 5. Amending and re-enacting Section 10 of Act 44 of 1886, relative to Fifth Louisiana Levee District.

Act 6. Amending and re-enacting Section 9 of Act 44 of 1886, relative to Fifth Louisiana Levee District.

Act 7. Creating the Plaquemines Parish East Bank Levee District.
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Act 16. Amending and re-enacting Section 1 of Act 43 of 1900, relative to Grand Prairie Levee District.

Act 18. Amending and re-enacting Sections 4, 5 and 6 of Act 24 of 1898, relative to the Grand Prairie Levee District.

Act 35. Authorizing Orleans Levee District to pay certain claims for property expropriated during the years 1894 and 1895.

Act 84. Authorizing the Boards of Commissioners of the Atchafalaya Basin and Lafourche Levee Boards to place a temporary dam at the head of Bayou Lafourche, etc., dredging Bayou Lafourche, etc.
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Act 87. General appropriation bill.

Act 90. Requiring Sheriffs of Parishes comprised within the various levee districts to furnish quarterly to the Secretaries of their levee districts duplicates of their settlements with the State Auditor.

Act 116. Amending and re-enacting Section 4 of Act 7 of 1902, relative to Plaquemines Parish East Bank Levee District.

Act 119. Requiring Police Juries to drain the public roads and levees of the State.

Act 123. Authorizing the Governor to direct the Board of State Engineers to survey all unsurveyed lands belonging to the State, not embraced in any of the levee districts.
Repealed by Act 86 of 1904.

Act 124. Authorizing the Governor to direct the Board of State Engineers to survey all islands, as well as all other lands, belonging to the State, not embraced in any of the levee districts.

Repealed by Act 86 of 1904.

Act 140. Amending and re-enacting Section 10 of Act 97 of 1890, relative to the Atchafalaya Basin Levee District.

Act 145. Amending and re-enacting Act 5 of 1899, Extra Session, relative to drainage districts.

Act 159. Amending and re-enacting Act 12 of 1900, relative to the organization of drainage districts.

Act 161. Amending and re-enacting Act 70 of 1900, relative to the Board of Control of the State Penitentiary.

Act 166. Creating the Courtableau Levee District.

Act 168. Amending and re-enacting Act 70 of 1900, relative to the Board of Control of the State Penitentiary.

Act 171. Authorizing the Governor to direct the Board of State Engineers to survey certain lands in Caddo Parish. Repealed by Act 86 of 1904.

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Act 11. Amending and re-enacting Section 1 of Act 7 of 1902, relative to the Plaquemines Parish East Bank Levee District.

Act 19. Authorizing the Board of Commissioners of the Buras Levee District to close Red Pass at the Jump.

Act 27. Granting certain lands to the Grand Prairie Levee District.

Act 28. Authorizing the Bossier Levee Board to issue $100,000 of bonds.
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Act 42. Granting right of way across Angola State Farm to the Louisiana Railway and Navigation Company.

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Act 79. Creating the Mermentau Levee District.

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Act 109. Creating the Red River and Bayou des Glaizes Levee and Drainage District.

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Act 170. Memorializing Congress to divorce the Mississippi River from the Red River, and to build certain levees above the mouth of the Red River.

Act 175. Amending and re-enacting Act 36 of 1894, requiring all State and District Boards to file with the State Auditor and to publish in a newspaper, published at the domicile of said Board, semi-annual itemized detailed reports.

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Arkansas Levee Commissioners invited to confer with Louisiana Legislative Committees, Act 8 of 1886.

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Act 9 *of* 1900 authorizes the Atchafalaya Basin Levee District and the Lafourche Basin Levee District, jointly, to construct locks at the head of Bayou Lafourche.

Act 84 *of* 1902 authorizes the Boards of Commissioners of the Atchafalaya Basin and Lafourche Basin Levee Districts, jointly, to construct a temporary dam at the head of Bayou Lafourche, to erect siphons, pumps, etc., and to maintain a certain supply of fresh water in the Bayou.

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Angola Farm. Act 42 of 1904 grants right of way across Angola Farm (State convict farm) to the Louisiana Railway and Navigation Co., and imposes certain duties upon the Board of State Engineers in connection therewith.

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Act 117 of 1888 authorizes State Auditor to warrant against the different levee funds for the expense of keeping same.

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Act 36 of 1894 requires all State and District Boards, State and District Officers, to file with Auditor of Public Accounts itemized, detailed semi-annual reports.

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B.

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Act 9 of 1878 authorizes Board of State Engineers to use certain funds reserved by Act 139 of 1877. Also provides for traveling expenses of Board.

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Act 48 of 1886 authorizes the Board of State Engineers to examine, survey and furnish to the Governor of the State estimates of the probable cost of closing Morganza and Diamond Island Levees.

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Act 79 of 1890. Duties of the Board relative to the Red River, Atchafalaya and Bayou Bœuf Levee District.

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Act 110 of 1894. Duties of the Board relative to the Cat Island Levee District.

Act 48 of 1896 authorizes the Board to examine the Baptiste Collette Canal, and to close it under certain conditions.

Act 24 of 1898. Duties of the Board of State Engineers relative to the Grand Prairie Levee District.

Article 239 of the Constitution of 1898 authorizes the several levee districts, with the consent of the Board of State Engineers, to contract with steam railroads to operate on the levees.

Article 294 of the Constitution of 1898 orders the Board of State Engineers, whenever called upon so to do, to furnish the different road districts with such plans, specifications, etc., as will tend to create a uniform system of public roads throughout the State.

Act 7 of 1902. Duties of the Board relative to the Plaquemines Parish East Bank Levee District.

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Act 123 of 1902 authorizes the Governor to direct the Board of State Engineers to survey all unsurveyed lands belonging to the State not embraced within the limits of any of the levee districts.

Act 124 of 1902 authorizes the Governor to direct the Board of State Engineers to survey all islands, as well as all other lands, belonging to the State, not embraced within the limits of any of the levee districts.

Act 166 of 1902. Duties of the Board with regard to Courtableau Levee District.

Act 171 of 1902 authorizes the Governor to direct the Board of State Engineers to survey certain lands in Caddo Parish.

Act 212 of 1902 authorizes the Board of State Engineers to make a complete and thorough topographic and hydrographic survey of Bayou Fusilier.

Act 42 of 1904 imposes certain duties upon the Board of State Engineers in connection with right of way granted to the Louisiana Railway and Navigation Company across Angola Farm.

Act 79 of 1904. Duties of the Board of State Engineers with regard to the Mermentau Levee District.

Act 170 of 1904. Duties of the Board with regard to Red River and Bayou des Glaizes Levee and Drainage District.

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Bayou Boeuf. Act 76, Extra Session of 1878, authorizes State Engineers to make survey of.

Banquettes. Act 78 of 1886, requiring banquettes to be built along slopes of levees crossing bayous or sloughs.

Barataria Canal. Act 97 of 1877, Extra Session. Duties of the Board of State Engineers with regard to.

Bayou Teche. Act 119 of 1877, Extra Session, orders Board of State Engineers to make survey of.

Bayou Grosse Tete. Act 83 of 1878 ordering State Engineer to make survey of.

Bonnet Carre Crevasse. Act 5 of 1878, Extra Session, provides for closure of.

Bayou Fontaine. Act 58 of 1886 makes appropriation to re-establish drainage of.

Back Levees. Act 67 of 1888 authorizes police juries of certain parishes to build back levees for protection against tidal overflow.

Bayou Pierre. Act 96 of 1890. Duties of Board of State Engineers relative to drainage of.

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Bossier Levee District. Created by Act 89 of 1892.

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Act 28 of 1894 authorizes the Board to issue $100,000 of additional bonds.

Buras Levee District. Created by Act 18 of 1894.

Act 80 of 1898 amends Section 10 of Act 18 of 1894.

Act 97 of 1898 authorizes the Buras Levee Board to issue $25,000 of bonds.

Act 19 of 1904 authorizes the district to close Red Pass at the Jump.

Bougere Crevasse. Act 48 of 1894 orders the Board of State Engineers to make a survey of.

Act 11 of 1900 authorizes the Board of State Engineers to make a survey of.

Baptiste Collete Canal. Act 48 of 1896 authorizes the Board of State Engineers to examine this canal and to close it under certain conditions.

Bonds. Article 239 of Constitution of 1898 authorizes the several levee districts of the State, for the purpose of refunding outstanding bonds, to issue new bonds in lieu thereof.

Article 281 of Constitution of 1898, prescribing how drainage districts, parishes, municipalities, etc., may incur debt and issue negotiable bonds therefor.

Act 14 of 1898. To carry into effect Article 239 of Constitution of 1898.

Act 114 of 1900. To carry into effect Article 281 of Constitution of 1898.

Battures. Article 290 of the Constitution of 1898 permits riparian owners of land on navigable rivers, lakes, etc., to construct on banks or battures owned by them, buildings, wharves, etc., under certain conditions.

Bayou Courtableau. Act 17 of 1898, concurrent resolution, memorializing Congress to appropriate $15,000 to remove drift from Bayou Courtableau.

Bayou Lafourche. Act 27 of 1898, concurrent resolution, memorializing Congress to construct locks in Bayou Lafourche.

Act 9 of 1900 authorizes the Board of Commissioners of the Atchafalaya Basin and Lafourche Basin Levee Districts, jointly, to construct locks at the head of Bayou Lafourche as soon as the consent of the Federal Government shall have been obtained. (Federal consent given in Rivers and Harbors Act, Public No. 154, approved June 13, 1902, which also authorizes the Boards to build a temporary dam across Bayou Lafourche, to be removed December 13, 1904.)

Act 48 of 1902 authorizes the Atchafalaya Basin and Lafourche Basin Levee Districts to place a temporary dam at the head of Bayou Lafourche, construct siphons, locks, dams and canals, and to maintain a certain depth of fresh water in the bayou.

Act 36 of 1904 amends and re-enacts Section 3 of Act 84 of 1902, removes restrictions imposed by Act 84 of 1902, prohibiting the

cutting of canals in Ascension and Assumption Parishes, and authorizes the boards to cut canals at any point on the bayou.

House Joint Resolution No. 126, of the 58th Congress, Second Session, dated April 2, 1904, extends the time for the removal of the temporary dam at the head of Bayou Lafourche for an additional period of three years, to be computed from the expiration of the time set in the original act (Dec. 13, 1904).

Board of Control, State Penitentiary. Created by Act 70 of 1900.

Act 161 of 1902 amends and re-enacts Sections 17 of Act 70 of 1900.

Act 168 of 1902 amends and re-enacts Sections 4, 10 and 12 of Act 70 of 1900.

Act 42 of 1904 grants right of way across Angola Farm (State convict farm) to the Louisiana Railway and Navigation Company, and imposes certain duties upon the Board of State Engineers.

Bayou Fusilier. Act 212 of 1902 authorizes the Board of State Engineers to make a complete and thorough topographic and hydrographic survey of Bayou Fusilier.

Banquette. Act 78 of 1886, requiring banquettes to be built along slope of levees crossing bayous or sloughs.

C.

Caddo Sub-Districts Fund. Act 73 of 1882 provides what portion of the General Engineer Fund shall be expended in the sub-districts of Caddo, Bossier, Red River, De Soto, Natchitoches, Grant and Rapides.

Act 12 of 1884, relative to transfers from Levee and Drainage Fund to General Engineer's Fund and Caddo Sub-District Fund.

Act 83 of 1884, amending and re-enacting Act 73 of 1882 relative to Caddo Sub-Districts Fund.

Act 124 of 1884, transferring to the Caddo Sub-Districts Fund certain money from the General Fund of 1882.

Act 60 of 1886, amending and re-enacting Act 83 of 1884 relative to Caddo Sub-Districts Fund.

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Caving Banks. Act 123 of 1884 requests the Mississippi River Commission to adopt plan to prevent same.

Corporations. Act 80 of 1890 authorizes corporations or boards of public works to borrow money.

Act 93 of 1894 amends Act 80 of 1890.

Caddo Levee District. Created by Act 74 of 1892.

Act 90 of 1894 amends Act 74 of 1892.

Act 142 of 1900 authorizes the Board to issue $100,000 of additional bonds.

Act 160 of 1900 amends and re-enacts Sections 1 and 9 of Act 74 of 1892.

Cat Island Levee District. Created by Act 110 of 1894.

Concordia Parish. Act 131 of 1894 authorizes Concordia Parish to issue bonds, through its Police Jury, for levee purposes.

Carondelet Canal. Article 195 of the Constitution of 1898, Carondelet Canal and Bayou St. John not to be leased or alienated when they shall come into the possession of the State.

Courtableau Levee District. Created by Act 166 of 1902.

Cutting Levees. Act 84 of 1884 (Section 3) prohibits cutting of public levees for any purpose whatsoever, except for the repair or reconstruction of same, and prescribes penalty for violation of this law.

Act 144 of 1890 prohibits cutting of public levees.

Act 98 of 1892 prohibits cutting of levees.

D.

Driving. Act 108 of 1888 prohibits riding and driving over the public levees.

Drainage Districts. Article 281 of Constitution of 1898 prescribes how drainage districts, parishes and municipalities, the Parish of Orleans excepted, may issue bonds and levy annual taxes.

Act 5 of 1899 , Extra Session, to carry into effect Article 281 of Constitution of 1898 relative to drainage districts.

Act 12 of 1900, relative to the organization of drainage districts in the parishes of the State, Orleans Parish excepted.

Act 114 of 1900, relative to the organization of drainage districts.

Act 145 of 1902, amending and re-enacting Act 5 of 1899, Extra Session, relative to organization of drainage districts.

Act 159 of 1902 amends and re-enacts Act 12 of 1900.

Act 211 of 1902 authorizes drainage districts organized under State laws to levy annual contributions.

Act 61 of 1904 invests the various levee and drainage districts of the State with the control of all drainage channels within the limits of their districts.

Act 186 of 1904, joint resolution, proposing an amendment to Article 281 of Constitution of 1898, relative to drainage districts.

Diamond Island Bend. Act 48 of 1886 authorizes the Board of State Engineers to stake out and estimate cost of Morganza and Diamond Island levees.

Drainage. Act 21 of 1898 authorizes the police juries to cut ditches and canals through private property for the purpose of draining the public roads.

Act 119 of 1902 requires police juries to drain all public roads parallel to or contiguous to the public levees.

E.

Eldridge, W. B. Act 39 of 1896 makes appropriations out of the General Engineer Fund to pay counsel fees in the case of W. B. Eldridge vs. The Board of State Engineers and Peter J. Trezevant, contractor.

F

Fordoche and Grosse Tete Levee District. Act 46 of 1877, Extra Session, relative to Fordoche and Gross Tete Levee District.

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Act 97 of 1882 authorizes the Fordoche and Grosse Tete Special Levee District to issue bonds.

First Levee District. Created by Act 5 of 1878, Extra Session.
Act 33 of 1879 amends Act 5 of 1878, Extra Session.
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Fourth Levee District. Created by Act 5 of 1878, Extra Session.
Act 33 of 1879 amends Act 5 of 1878, Extra Session.
Repealed by Act 97 of 1890.

Fifth Levee District. Created by Act 5 of 1878, Extra Session.
Act 33 of 1879 amends Act 5 of 1878, Extra Session.
Repealed by Act 44 of 1886.

Federal Government. Article 215 of the Constitution of 1879, cancels Articles 213 and 214 when Federal Government shall have taken charge of the levees.

Article 240 of the Constitution of 1898 authorizes the Federal Government to make such surveys within the State as may be necessary to carry into effect the Act of Congress creating the Mississippi River Commission.

Fifth Louisiana Levee District. Created by Act 44 of 1886.

Act 79, of 1886, authorizes certain taxes due by the V. S. & P. R. R. to be credited to the Fifth Louisiana Levee District, and authorizes the parishes of Ouachita, Richland and Madison to appropriate money to the Fifth Louisiana Levee District.

Act 118 of 1886 authorizes the Fifth Louisiana Levee District to build levees in Arkansas.

Act 16 of 1890 amends Sections 4 and 5 of Act 44 of 1886.

Act 125 of 1890 authorizes the Board to issue bonds in place of certain bonds that have been lost or stolen.

Act 1 of 1892 transfers $10,000 from the Levee and Drainage Fund to the Fifth Louisiana Levee District.

Act 4 of 1892 amends and re-enacts Section 9 of Act 44 of 1886.

Act 48 of 1894 amends and re-enacts Section 10 of Act 44 of 1886.

Act 11 of 1900 amends and re-enacts Section 10 of Act 48 of 1894, authorizes the Fifth Louisiana Levee District to levy a special assessment, and authorizes the Board of State Engineers to make a survey of Bougere crevasse.

Act 5 of 1902 amends and re-enacts Section 10 of Act 44 of 1886.

Act 6 of 1902 amends and re-enacts Section 9 of Act 44 of 1886.

Act 51 of 1904 authorizes the Board of Commissioners of the Fifth Louisiana Levee District to anticipate its revenues for levee work.

Funds. See under following headings:

General Engineer Fund.
Caddo Sub-Districts Fund.
Natchitoches Sub-Districts Fund.
Levee and Drainage Fund.

Free Passes. See under heading of "Passes."

G

General Engineer Fund. Act 33 of 1879 (Section 6) directs the Auditor to levy upon the assessment rolls of 1878, and annually thereafter, a tax of one mill on the dollar to constitute the General Engineer Fund.

Act 33 of 1879 (Section 11). General Engineer Fund to be spent by Governor; any levee district refusing to comply with estimates of Board of State Engineers shall not be entitled to any portion of the General Engineer Fund.

Article 213 of Constitution of 1879 authorizes levy of a tax not to exceed one mill on the dollar for levee purposes.

Act 102 of 1880 transferring levee and drainage money to General Engineer Fund.

Act 73 of 1882 relative to distribution of General Engineer Fund.

Act 12 of 1884 relative to transfers to General Engineer Fund from Levee and Drainage Fund.

Act 33 of 1884 appropriating a certain sum from the General Engineer Fund for the repair of Mill Bayou Culvert.

Act 83 of 1884 amends and re-enacts Act No. 73 of 1882 relative to distribution of General Engineer Fund.

Act 60 of 1886 amending and re-enacting Act 83 of 1884 relative to distribution of General Engineer Fund.

Act 85 of 1888, Section 89, levying a one mill tax for General Engineer Fund.

Act 102 of 1892 amends and re-enacts Acts 83 of 1884, and 60 of 1886, relative to distribution of General Engineer Fund.

Act 178 of 1894 provides for the levying of a one mill tax for General Engineer Fund.

Act 39 of 1896 makes appropriations out of the General Engineer Fund to pay counsel fees in the case of Wm. B. Eldridge vs. the Board of State Engineers and Peter J. Trezevant, contractors.

Article 238 of Constitution of 1898 authorizes the levy of a one mill tax on all property in the State to be applied exclusively to the maintenance of a levee system (General Engineer Fund).

(For appropriations out of General Engineer Fund for salaries, expenses, etc., of Board of State Engineers, see under heading of "Appropriations.")

Grand Prairie Levee District. Created by Act 24 of 1898.

Act 41 of 1900 authorizes the Grand Prairie Levee District to issue $5,000 of additional bonds.

Act 43 of 1900 amends and re-enacts Section 1 of Act 24 of 1898, extends the limits of the district.

Act 16 of 1902 amends and re-enacts Section 1 of Act 43 of 1900.

Act 18 of 1902 amends and re-enacts Sections 4 and 5 of Act 24 of 1898.

Act 27 of 1904 grants certain lands to the Grand Prairie Levee District.

H

Hardie, Mrs. Act 55 of 1882 for the relief of.

High Water Emergency Fund for 1892. Act 35 of 1892 creates.

Hogs. Act 84 of 1884 (Section 2) relative to killing hogs roaming at large on levees.

I.

Irrigating Lands. Act 62 of 1892 specifies distance from base of levee at which siphons may discharge.

Act 98 of 1892 regulates use of siphons over levees for irrigating purposes, prescribes the distance from the levee for irrigating lands, and prohibits cutting of levees.

I. C. R. R. Embankment. Act 91 of 1892 requests the Governor to instruct the Board of State Engineers to make a survey of said embankment to determine whether it interferes with natural drainage of crevasse water.

J

James & McGinty. Act 85 of 1884 authorizes contract with James & McGinty for construction of certain levees.

K

Kingman, Capt. Dan C. Act 2 of 1890, concurrent resolution thanking Captain Dan C. Kingman for efficient levee services rendered.

L

Louisiana Levee Company. Act 139 of 1877, Extra Session, repeals Act 4 of 1871 creating Louisiana Levee Company.

Article 3 of Constitution of 1879 (miscellaneous ordinances for relief of taxpayers) relative to Louisiana Levee Company warrants.

Levee Districts. Act 31 of 1878 authorizes Governor to appoint a commission with regard to forming a levee district from mouth of Arkansas River to mouth of Red River.

Act 33 of 1879 (Section 11). Any levee district refusing to comply with estimates of Board of State Engineers shall not be entitled to any portion of General Engineer Fund.

Act 33 of 1879 (Section 12). Levee Commissioners failing to levy district tax for levee purposes, Auditor of Public Accounts directed to do so.

Article 214 of 1879 authorizes the creation of levee districts.

Article 216 of Constitution of 1879 authorizes the creation of interstate levee districts.

Article 239 of Constitution of 1898 authorizes the General Assembly to divide the State into levee districts, to provide for the appointment or election of levee commissioners, authorizes the commissioners to levy a tax of ten mills on the dollar and prescribes how a larger tax may be levied, authorizes the Board of Levee Commissioners, with the consent of the Board of State Engineers, to enter into contract with steam railroads to operate on

the levees, and authorizes the Boards of Commissioners of the several levee districts for the purpose of refunding outstanding bonds, to issue new bonds in lieu thereof.

Act 14 of 1898 to carry into effect Article 239 of Constitution of 1898, relative to levee districts.

Act 61 of 1904 invests the various levee and drainage districts of the State with the control of all drainage channels within the limits of their district.

See also under the following headings:

Tensas Basin Levee District.
Fifth Louisiana Levee District.
Atchafalaya Basin Levee District.
Pontchartrain Levee District.
Cat Island Levee District.
Lafourche Basin Levee District.
Orleans Levee District.
Lake Borgne Basin Levee District.
Buras Levee District.
Grand Prairie Levee District.
Plaquemines Parish East Bank Levee District.
Caddo Levee District.
Bossier Levee District.
Red River, Atchafalaya and Bayou Bœuf Levee District.
Red River and Bayou Des Glaizes Levee and Drainage District.
Courtableau Levee District.
Mermentau Levee District.
Fordoche and Grosse Tete Levee District.
Atchafalaya and Bayou Des Glaizes Special Levee District.
First Levee District.
Second Levee District.
Third Levee District.
Fourth Levee District.

Levees. (Relative to Care and Preservation of.)

Act 140 of 1877, Extra Session, vests control of levees in the Police Juries.

Act 5 of 1878, Extra Session, repeals Act 140 of 1878, Extra Session, and again vests control of levees in the Police Juries.

Act 33 of 1879 repeals Act 5 of 1879, Extra Session, and again vests control of levees in the Police Juries.

Act 88 of 1880 provides for the protection of levees by Police Juries, and defines how levees may be cut for rice flumes.

Act 104 of 1882 amends Act 88 of 1880, relative to the protection of levees by the Police Juries and their cutting for rice flumes.

Act 84 of 1884 repeals Act 88 of 1880, and Act 104 of 1882. Vests control of levees in Police Juries, orders Police Juries to cause drainage ditches to be cut to allow the free flow of seepage water away from the levees, to drain the battures, to have all weeds, saplings, etc., cut from the public levees, to build ramps over the levees wherever it is necessary for the accommodation of the public; defines how rice flumes, conduits, etc., may be placed through or under the levees, and makes it the duty of the Police Juries to cause to be killed all hogs found running at large upon the public levees, and prohibits cutting of levees.

Act 112 of 1886 amends Section 5 of Act 84 of 1884, exempts the east bank of the Parish of Orleans from the provisions of said act, and exempts from the operation of the act in so far as it relates to rice flumes, the Parish of Lafourche, and that portion of the Parish of Plaquemines on the right bank of the Mississippi River below the lower line of Live Oak Grove Plantation, and on the left bank of said river below the line of Belair Plantation, and relegates to the Police Juries of said Parish of Lafourche and said portion of the Parish of Plaquemines the duty of prescribing the manner in which levees may be cut for the purpose of placing rice flumes.

Act 108 of 1888. Making riding, driving or hauling over the public levees of this State a misdemeanor.

Act 60 of 1890. Making it unlawful for live stock of every description to go on the levees, and the space between the base of the levee and the drainage ditch during the time that water is against the levees.

Act 144 of 1890 regulates the manner of placing pipes through the public levees of the State, for the purpose of irrigation or other- the public levees of the State, for the purpose of irrigating or otherwise, and orders the Police Juries to have removed from the levees of the State all existing rice flumes, pipes, dahls, etc., prohibiting the cutting of levees, exempting from the provisions of the act the Parish of Orleans, east bank, that portion of the Parish of Plaquemines on the right bank of the Mississippi River below the lower line of Live Oak Grove Plantation, and on the left bank of said

river below the lower line of Belair Plantation, and that portion of Lafourche Parish on both sides of Bayou Lafourche below Lafourche Crossing. Prohibits cutting of levees.

Act 5 of 1892. Requiring the Police Juries of the different parishes of the State to cause to be removed from the levees of the State before the first day of January, 1893, all rice flumes, dahls, pipes, or other conduits now existing in the levees of the State, making it a misdemeanor for any person to place in the public levees of the State any rice flumes, pipes, dahls or other conduits after the first day of October, 1892, exempting from the provisions of this act levees on the Mississippi River not embraced within the limits of the Fifth Louisana, the Atchafalaya, the Lafourche, the Pontchartrain, the Lake Borgne and the Orleans Levee Districts, and the levees in the Lake Borgne Levee District below the lower line of Monsecour Plantation.

Act 16 of 1892, making the placing upon the levees of lumber, building material, fuel, fences, buildings, constructions, or anything which obstructs the levees or free passage thereon, or the safety thereof, or the tying of logs to the levees, punishable by fine or imprisonment, or both, at the discretion of the court; exempts from the provisions of the act movable property placed upon the wharves and landings in the City of New Orleans.

Act 62 of 1892, amending Sections 2 and 5 of Act 5 of 1892, exempting from the provisions of Act 5 of 1892, in addition to the exemptions contained in the latter act, pipes placed through the levees of the City of New Orleans, with the consent of the municipal authorities, and in other cities of the State with the consent of the Police Jury of the parish in which the city may be situated, for the purpose of sewerage, water, etc., and locks connecting the navigable canals of this State with the Mississippi River, and providing that the discharge end of all siphons used for irrigation or for other purposes shall be at least 27 feet from the inside base of the levee and at right angles thereto.

Act 46 of 1894, amending Act 60 of 1890, making it unlawful for live stock to go on levee during high water.

Act 196 of 1898, prohibiting the placing in the public levees of the State of any rice flumes, dahls, pipes, or other conduit, and ordering the removal of any rice flumes, dahls, pipes, conduits, etc., now existing in the public levees of the State, exempting from the provisions of the act levees on the Mississippi River not embraced

within the limits of the Fifth Louisiana Levee District, the Atchafalaya, the Lafourche, the Lake Borgne, the Grand Prairie, the Buras and the Orleans Levee District, and pipes placed through the levees of the City of New Orleans with the consent of the municipal authorities and in other cities (see Section 1, Act 136 of 1898, page 224, for definition of cities) of the State, and locks connecting the navigable canals of the State with the Mississippi River.

Article 239 of the Constitution of 1898 authorizes the Boards of Levee Commissioners, with the consent of the Board of State Engineers, to enter into contract with steam railroads to operate on the public levees of the State.

Act 119 of 1902 requires Police Juries to drain public roads adjoining public levees.

Louisiana Ry. & Navigation Co. Act 42 of 1904 grants right of way across Angola (State Convict Farm) to the Louisiana Ry. & Navigation Co.

Levee Work. Act 69 of 1878, amends Section 6, Act 140, of 1877, relative to payment for levee work.

Act 33 of 1879 (Section 3), Governor of State to advertise for proposals to make such improvements and construct such levees as are recommended by the Board of State Engineers, and shall award the contracts to the lowest responsible bidders, who shall give such bonds for the faithful performance of their contracts as shall be required by the Governor.

Act 10 of 1882 constituting the construction and maintenance of levees works of public improvement.

Act 85 of 1884 authorizing the Governor and the Board of State Engineers to contract with S. L. James and John McGinty for levee work.

Act 78 of 1886 requiring banquettes to be built to levees crossing bayous or sloughs.

Act 33 of 1890—Joint Resolution—instructing the Board of State Engineers to cause to be removed from the base of all levees hereafter to be built all stumps, logs, roots, trees and other matter susceptible to decay.

Act 26 of 1894 authorizes Police Juries to work parish prisoners on roads, levees, public works, etc., under certain conditions.

Act 10 of 1898—Concurrent Resolution—No levee commissioner, officer or employe, directly or indirectly, to be interested in any levee work.

Act 10 of 1882, levees works of public improvement.

Levee System. Article 213 of the Constitution of 1879 orders the maintenance of a levee system and authorizes the levy of a one mill tax for this purpose.

Article 238 of Constitution of 1898 orders the maintenance of a levee system and authorizes the levy of a one mill tax for this purpose.

Act 1 of 1890—Concurrent Resolution—declaring efficacy of levee system and condemning outlets.

Levee and Drainage Fund. Act 102 of 1880 transfers certain moneys from the Levee Drainage Fund to the General Engineers Fund.

Act 56 of 1882 authorizes relief to overflow sufferers out of the Levee and Drainage Fund.

Act 12 of 1884 relative to transfers from Levee and Drainage Fund to General Engineer Fund.

Act 1 of 1892 transfers $10.000 from the Levee and Drainage Fund to the Fifth Louisiana Levee District.

Levee Taxes. Act 20 of 1884 prohibits collection of in the Fifth Municipal District of Orleans.

Levee Funds. State Auditor authorized to warrant against same for expense of keeping accounts of the various levee district funds, Act 117 of 1888.

Act 83 of 1892 authorizes State Auditor to warrant against the various district levee funds for expense of keeping accounts of same.

Logs. Act 23 of 1890—Joint Resolution—instructing the Board of State Engineers to cause to be removed from the base of all levees hereafter built all logs, roots, trees, stumps and other matter susceptible to decay.

Act 16 of 1892 prohibits the tying of logs to the levees.

Live Stock. Act 60 of 1890 making it unlawful for live stock of any description to go on the levees during high water.

Act 46 of 1894 provides a penalty for any one seeking, by force, to release any live stock impounded under the provisions of Act 60 of 1890.

Lafourche Basin Levee District. Created by Act 13 of 1892.

Act 100 of 1892 amends and re-enacts Section 1 of Act 13 of 1892

Act 19 of 1894 amends and re-enacts Section 9 of Act 13 of 1892.

Act 175 of 1894 amends and re-enacts Section 1 of Act 100 of 1892.

Act 9 of 1900 authorizes the Atchafalaya Basin and Lafourche Basin Levee Districts, jointly, to construct locks at the head of Bayou Lafourche.

Act 84 of 1902 authorizes the Atchafalaya Basin and Lafourche Levee Boards, jointly, to construct a temporary dam at the head of Bayou Lafourche, construct siphons, locks, etc., and maintain a certain supply of fresh water in Bayou Lafourche.

Act 55 of 1904 grants certain lands to the Lafourche Basin Levee District.

Act 36 of 1904 amends and re-enacts Section 3 of Act 84 of 1902 (relative to Bayou Lafourche improvements).

Act 116 of 1904 transferring a certain sum from the Land and Levee Fund to Lafourche Basin Levee District.

Lake Borge Basin Levee District. Created by Act 14 of 1892.

Lumber. Act 16 of 1892 prohibits the placing of lumber, building material, fuel, fences, buildings, etc., on the levees, and the tying of logs to same.

Levee Laws. Act 52 of 1896 provides for the submission to the voters of a proposition to hold a Constitutional Convention and imposes certain restrictions among which one on the subject of levee laws.

Levee Board Lands. Act 126 of 1896 amends and re-enacts Section 3 of Act 80 of 1888 so as to exempt from the provisions of the later act all levee board lands.

Locks. Act 196 of 1898 refers to locks connecting the navigable canals of the State with the Mississippi River.

Act 9 of 1900 authorizes the Atchafalaya Basin and Lafourche Basin Levee Boards jointly to place locks at the head of Bayou Lafourche.

Levee Commissioners. Act 10 of 1898—Concurrent Resolution—no Levee Commissioner, officer or employee, directly or indirectly, to be interested in any levee work.

Land and Levee Fund. Act 116 of 1904 transferring a certain sum to the Lafourche Basin Levee District from the Land and Levee Fund.

M.

Mississippi River Com. Article 215 of the Constitution of 1879 authorizes the Mississippi River Commission to make surveys and construct works of public improvement in the State.

Act 123 of 1884—Con. Resolution—requesting Miss. River Com. to adopt plan to prevent caving of bank.

Mill Bayou Culvert. Act 33 of 1884, appropriation for.

Morganza and Diamond Island Bend Levees. Act 48 of 1886 authorizes the Board of State Engineers to make surveys and estimates of cost.

Madison Parish. Act 79 of 1886 authorizes Madison Parish to appropriate certain money to the Fifth Louisiana Levee District.

Mill Bayou. Act 62 of 1894 authorizes the Board of Commissioners of the R. R. A. & B. B. Levee District to build a culvert at the mouth of Mill Bayou.

Mermentau Levee District. Created by Act 79 of 1904.

Mississippi River. Act 170 of 1904—Concurrent Resolution—memorializing Congress to divorce the Mississippi River from Red River and build certain levees above the mouth of Red River.

N

Natchitoches Sub-Districts Fund. Act 83 of 1884 provides what portion of the General Engineer Fund shall be expended in the sub-districts of Natchitoches, Rapides and Avoyelles.

Act 12 of 1884 relative to transfers from Levee and Drainage Fund to Natchitoches sub-districts fund.

Act 124 of 1884 transfers certain moneys to the Natchitoches sub-district Fund.

Act 60 of 1886 amends Act 83 of 1884.

Act 102 of 1892 amends and re-enacts Act 83 of 1884 relative to distribution of General Engineer Fund.

New Basin Canal and Shell Road. Act 39 of 1888 authorizes the Board of State Engineers to make a survey of.

Act 144 of 1888 appointing a Board of Control for, and fixing the duties of the Board of State Engineers with regard to same.

Act 51 of 1894 makes it unlawful for the City of New Orleans and others to drain into the New Basin Canal.

Act 82 of 1896 amends Section 12 of Act 144 of 1888.

Act 152 of 1900 makes it unlawful to place obstructions to navigation in Lake Pontchartrain at the mouth of the New Basin Canal.

Act 10 of 1904 amends and re-enacts Section 4 of Act No. 144 of 1888.

O

Overflowed Lands and Property. Act 59 of 1882 provides for assessment of.

Ouachita Parish. Act 79 of 1886 authorizes Ouachita Parish to appropriate money to the Fifth Louisiana Levee District.

O'Malley, Thomas. Act 53 of 1892 appropriates $1,500 for the relief of Thomas O'Malley for loss of tools, etc., on levee work in Parish of Pointe Coupee.

Oyster Industry. Act 110 of 1892 to encourage, protect and regulate the oyster industry, and requiring the Board of State Engineers to furnish certain maps, etc.

Act 121 of 1896 repeals and re-enacts Act 110 of 1892.

Ouachita River. Act 15 of 1898—Concurrent Resolution—Memorializing Congress relative to the construction of a system of locks and dams in the Ouachita River.

Orleans Levee District. Created by Act 93 of 1890.

Act 41 of 1892 authorizes the Board of Commissioners of the Orleans Levee District to levy a special tax for the year 1892 to indemnify the owners of certain property expropriated, damaged or destroyed for levee purposes.

Act 79 of 1892 amends and re-enacts Section 6 of Act 93 of 1890.

Act 25 of 1894 authorizes the Board to make payments to persons whose property has been expropriated in accordance with Act 41 of 1892.

Article 312 of Constitution of 1898 gives right of action to owners of expropriated property against the Orleans Levee District.

Act 79 of 1898 authorizes the Orleans Levee District to levy a special tax for the year 1898 to indemnify the owners of certain property expropriated.

Act 116 of 1898 authorizes the Orleans Levee District to issue $500,000 of bonds.

Act 140 of 1900 amends and re-enacts Section 6 of Act 79 of 1892.

Act 145 of 1900 amends and re-enacts Section 4 of Act 93 of 1890.

Act 35 of 1902 authorizes the Orleans Levee District to pay certain claims for property expropriated during the year 1894 and 1895.

Obstructions on Levees. Act 16 of 1892 prohibiting placing of obstructions on levees.

Overflow Sufferers. Act 56 of 1882 makes appropriation out of the Levee and Drainage Fund for the relief of overflow sufferers.

P

Police Juries. Act 140 of 1877, Extra Session, vests control of levees in Police Juries of the several parishes.

Act 5 of 1878, Extra Session, gives control of levees to Police Juries.

Act 33 of 1879 (Section 3). Board of State Engineers to report to Police Juries, in which surveys of levees are made, the extent of repairs necessary to be made by said Police Juries, with estimates and specifications, and shall, in addition to their duties as State Engineers, make such surveys and perform such services as may be required by parochial authorities in the repair and construction of levees and other public works.

Act 33 of 1879 vests control of levees in the Police Juries of the several parishes.

Act 88 of 1880 providing for protection of levees by Police Juries, also defining how levees can be cut for rice flumes, etc.

Act 41 of 1882 enabling Police Juries, except that of Orleans, to levy an annual rate of taxation to carry on works of public improvement.

Act 104 of 1882 amends and re-enacts Sections 3, 10, 11, 12 and 14 of Act No. 88 of 1880, providing for protection of levees by Police Juries, also defining how levees may be cut for rice flumes and roadways.

Act 84 of 1884 repeals Act 88 of 1880 and 104 of 1882, investing control of levees in Police Juries; relative to construction of ramps by Police Juries; drainage of levees; cutting of weeds; saplings, etc., and killing of hogs.

Act 67 of 1888 authorizing Police Juries of the various parishes subject to tidal overflow to construct side and back levees.

Act 131 of 1894 authorizes Police Jury of Concordia Parish to issue bonds for levee purposes.

Act 26 of 1894 authorizes Police Juries to work parish prisoners on roads, levees, public works, etc., under certain conditions.

Act 21 of 1898 authorizes Police Juries to cut ditches and canals through private property for the purpose of draining the public roads.

Act 119 of 1902 requires the Police Juries to drain all public roads parallel to or contiguous to the public levee.

Plaquemines Parish Canal Company. Act 86 of 1878, connection of Board of State Engineers with.

Pontchartrain Levee District. Created by Act 95 of 1890.

Act 68 of 1892 amends Section 7 of Act 95 of 1890.

Act 59 of 1894 authorizes the district to issue and negotiate $1,000,000 of bonds.

Act 96 of 1894 amends Section 12 of Act 95 of 1890.

Act 70 of 1900 amends and re-enacts Section 11 of Act 95 of 1890.

Act 4 of 1904 amends and re-enacts Section 4 of Act 95 of 1890.

Passes. Article 191 of the Constitution of 1898 provides that no member of the General Assembly or public officer, or person elected or appointed to a public office, shall demand or accept, for his own use or for the use and benefit of another, any free pass, free transportation, etc., etc.

Plaquemines Parish East Bank Levee District. Created by Act 7 of 1902.

Act 116 of 1902 amends and re-enacts Section 4 of Act 7 of 1902.

Act 11 of 1904 amends and re-enacts Section 1 of Act 7 of 1902.

Public Improvements. Act 10 of 1882 constitutes the construction and maintenance of levee works of public improvement.

Act 41 of 1882 enables Police Juries, except that of Orleans, to levy an annual tax to carry on works of public improvement.

Act 126 of 1882 prescribes how to hold special elections for the levying of special taxes for works of public improvement.

Act 80 of 1890 authorizes corporations or boards of public works to borrow money.

Act 93 of 1894 amends Act 80 of 1890.

Article 281 of Constitution of 1898 authorizes municipal corporations, parishes and drainage districts, the Parish of Orleans excepted, to issue bonds and levy an annual tax to carry on works of public improvement.

Act 114 of 1900 to carry into effect Article 281 of Constitution of 1898.

R

Rice Flumes. Act 88 of 1880 defines how levees may be cut for rice flumes.

Act 104 of 1882 amends and re-enacts Act 88 of 1880.

Act 84 of 1884 repeals Act 104 of 1882 and orders the removal of all conduits, etc., in the levees, except those built in accordance with plans made or approved by the Board of State Engineers.

Act 112 of 1886 exempts certain parts of certain parishes from the provisions of Act 84 of 1884.

Act 144 of 1890 regulates manner in which pipes may be placed in levees, and prohibits cutting of public levees.

Act 5 of 1892 prohibits the placing of rice flumes, dahls, pipes or other foreign substances in the levees, and requires Police Juries to cause such existing conduits to be moved before January, 1893.

Act 62 of 1892 amends Act 5 of 1892, and regulates the use of siphons for irrigation and other purposes.

Act 196 of 1898 amends and re-enacts Act 62 of 1892, prohibits the placing in the public levees of the State of any rice flumes, pipes, dahls, etc., exempts certain localities from the provisions of the act, and provides that act shall not apply to locks connecting the navigable canals of the State with the Mississippi River.

Richland Parish. Act 79 of 1886 authorizes Richland Parish to appropriate certain money to the Fifth Louisiana Levee District.

Riding and Driving over public levees prohibited by Act 108 of 1888.

Roots. Act 23 of 1890, joint resolution, instructing the Board of State Engineers to cause to be removed from the base of all levees hereafter to be constructed all roots, stumps, logs, trees, etc.

Railroads. Article 239 of the Constitution of 1898 authorizes the several levee districts, with the consent of the Board of State Engineers, to contract with steam railroads to operate on the levees.

Roads. Act 26 of 1894 authorizes Police Juries to work parish prisoners on roads, levees, etc., under certain conditions.

Article 294 of the Constitution of 1898 orders the Board of State Engineers, whenever called upon so to do, to furnish the different road districts with such plans, specifications, etc., as will tend to create a uniform system of public roads throughout the State.

Reports. Act 36 of 1894 requires all State and District Boards, State and district officers, to file with the Auditor of Public Accounts itemized, detailed, semi-annual reports.

Act 175 of 1904 amends and re-enacts Act 36 of 1894.

Roads. Act 21 of 1898 authorizes the Police Juries to cut ditches and canals through private property for the purpose of draining the public roads.

Act 119 of 1902 requires the Police Juries to drain all public roads parallel to or contiguous to the public levees.

Red River, Atchafalaya and Bayou Boeuf Levee District. Created by Act 79 of 1890.

Act 46 of 1892 amends and re-enacts Act 79 of 1890.

Act 62 of 1894 authorizes the district to build a culvert at the mouth of Mill Bayou.

Act 49 of 1900 authorizes the Board to issue $250,000 of additional bonds.

Red Pass. Act 19 of 1904 authorizes the Board of Commissioners of the Buras Levee District to close Red Pass at the Jump.

Red River and Bayou Des Glaizes Levee and Drainage District. Created by Act 109 of 1904.

Red River. Act 170 of 1904, concurrent resolution, memorializing Congress to divorce the Mississippi River from the Red River, and to build certain levees above the mouth of Red River.

Act 117 of 1877, Extra Session, duties of the Board of State Engineers relative to removing obstructions at mouth of.

Ramps. Act 84 of 1884 (Section 2), relative to construction of ramps by Police Juries.

S.

Surveys. Act 240 of Constitution of 1898 authorizes the Federal Government to make such surveys within the State as may be necessary to carry into effect the act creating the Mississippi River Commission.

Act 123 of 1902 authorizes the Governor to direct the Board of State Engineers to survey all unsurveyed lands belonging to the State not embraced in any of the levee districts.

Act 124 of 1902 authorizes the Governor to direct the Board of State Engineers to survey all islands as well as all other lands belonging to the State not embraced within the limits of any of the levee districts.

Act 171 of 1902 authorizes the Governor to direct the Board of State Engineers to survey certain lands in Caddo Parish.

Act 86 of 1904 makes it the duty of the Governor to direct the Register of the State Land Office to have surveys made of all unsurveyed public lands.

Second Levee District. Created by Act 5 of 1878, Extra Session. Act 33 of 1879 amends Act 5 of 1878, Extra Session. Act 95 of 1890 repeals that part of Act 33 of 1879 creating the Second Levee District.

St. Landry Parish. Act 103 of 1886 creates special levee district in Avoyelles and St. Landry Parishes, provided it be ratified by election (lost by election of October 4, 1886).

State Auditor. Act 33 of 1879 (Section 12), Levee Commissioners failing to assess tax provided for, Auditor of Public Accounts authorized to do so.

Act 117 of 1888 authorizes the State Auditor to warrant against the different levee funds for the expense of keeping same.

Act 83 of 1892 authorizes State Auditor to warrant against the various levee funds for the expense of keeping same.

Act 36 of 1894 requires all State and District Boards, State and District Officers, to file with Auditor of Public Accounts itemized, detailed, semi-annual reports of receipt and disbursements.

Act 175 of 1904 amends Act 36 of 1894, relative to statements to be filed with Auditor of Public Accounts.

Siphons. Act 62 of 1892 regulates use of siphons over levees for irrigation and other purposes.

Act 98 of 1892 regulates the use of siphons over levees, designates the distance from the levee for irrigating lands, and prohibits cutting of levees.

Sewell Dikes. Act 20 of 1896 recommends to the consideration of the Atchafalaya Basin Levee District the use of Sewall Dykes in the Bayou Goula Bend.

Statements. Act 90 of 1902 requires sheriffs of parishes comprised within the various districts to furnish quarterly to the secretaries of their levee districts duplicates of their settlements with the State Auditor.

Act 36 of 1894 requires all State and District Boards, State and District Officers, to file with the Auditor of Public Accounts itemized, detailed, semi-annual reports of receipts and disbursements.

Act 175 of 1904 amends Act 36 of 1894, relative to statements to be filed with Auditor of Public Accounts by all State and District Boards, etc.

T

Taxation. Act 5 of 1878, Extra Session, imposes taxes on lands and on products for levee purposes.

Article 214 of Constitution of 1879, limiting district taxation for levee purposes to 5 mills. Amendment proposed by Act 112 of 1884. Carried by election of April 17, 1888. Made operative by Act 8 of 1888.

Act 33 of 1879 (Section 6), to levy a tax of one mill on all taxable property of the State for levee purposes (General Engineer Fund).

Act 33 of 1879 (Section 8), authorizing levy of district taxes for levee purposes.

Article 204 of Constitution of 1879 ordering taxation for levee purposes.

Article 213 of Constitution of 1879 ordering maintenance of levees, and authorizing levy of a tax not to exceed one mill.

Act 126 of 1882 prescribing how elections may be held to levy taxes for the purpose of carrying on works of public improvement.

Act 20 of 1884 prohibits collection of district levee taxes in Fifth Municipal District of Orleans Parish.

Act 59 of 1884 relative to postponement of payment of taxes during years of overflow or public calamity.

Act 112 of 1884 proposing an amendment to Article 214 of

Constitution of 1879, permitting district levee tax of ten mills on the dollar, and prescribing how a larger tax may be levied (carried by election April 17, 1888, and made operative by Act 8 of 1888).

Act 8 of 1888 to carry into effect Article 214 of Constitution of 1879, as amended by Act 112 of 1884, carried at general election of April 17, 1888.

Act 80 of 1888 provides for disposition of property bid in for and adjudicated to the State for taxes for 1880 and subsequent years.

Act 36 of 1890 prohibiting the Register of Conveyances of Orleans from reporting on his certificates any adjudication of real estate to the State for levee taxes of 1880 and 1881, situated in the Fifth District of Orleans.

Act 10 of 1894 fixing the time within which to obtain postponement of payment and collection of taxes on account of overflow and other causes.

Act 65 of 1894 to secure more effective collection of the special assessments and forced contributions by the levee boards.

Act 126 of 1896 amends and re-enacts Act 80 of 1888.

Art. 238 of Constitution of 1898 provides that a levee system shall be maintained in the State, and a tax not to exceed one mill may be levied annually on all property subject to taxation, and shall be applied exclusively to the maintenance and repairs of levees.

Article 239 of Constitution of 1898 authorizes the Boards of Levee Commissioners of the several levee districts of the State to levy a tax of 10 mills on the dollar, and prescribes how this may be increased in case of necessity.

Third Levee District. Created by Act 5 of 1878, Extra Session, amended by Act 33 of 1879. Repealed by Act 13 of 1892.

Trees. Act 23 of 1890, joint resolution, instructing the Board of State Engineers to cause to be removed from the base of all levees hereafter to be constructed all trees, stumps, roots, etc.

Trezevant, Peter J. Act 39 of 1896 makes appropriations out of the General Engineer Fund to pay counsel fees in the case of W. B. Eldridge vs. the Board of State Engineers and Peter J. Trezevant, contractor.

Tensas Basin Levee District. Created by Act 26 of 1884.

Act 83 of 1884 relative to Tensas Basin Levee District's portion of General Engineer Fund.

Act 124 of 1884 transferring to the Tensas Basin Levee District a certain sum from the General Fund of 1882.

Act 59 of 1886 repealing Act 26 of 1884, and creating Tensas Basin Levee District.

Act 60 of 1886 amending and re-enacting Act 83 of 1884 relative to Tensas Basin Levee District's portion of General Engineer Fund.

Act 12 of 1884 relative to transfers from Levee and Drainage Fund to Tensas Basin Levee District.

Act 79 of 1886 authorizing certain taxes due by the V. S. & P. R. R. to be placed to the credit of Tensas Basin Levee District.

Act 77 of 1888 amends Act 59 of 1886 and repeals Act 26 of 1884.

Act 102 of 1892 amends Acts 83 of 1884 and 60 of 1886 relative to distribution of General Engineer Fund.

Act 103 of 1892 amends and re-enacts Act 59 of 1886.

Act 70 of 1894 amends and re-enacts Section 10 of Act 59 of 1886.

Act 117 of 1898 amends and re-enacts Sections 3 and 4 of Act 59 of 1886.

Act 20 of 1900 amends and re-enacts Act 117 of 1898.

V

V. S. & P. R. R. Act 79 of 1886 authorizing certain taxes due by the V. S. & P. R. R. to be placed to the credit of the Tensas Basin and Fifth Louisiana Levee Districts.

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